

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

MUNICIPAL SEPARATE STORM SEWER SYSTEM DISCHARGE PERMIT

Permit Number: MD0068357

2021 Annual Report

Submitted to:

State of Maryland
Department of the Environment
1800 Washington Blvd.
4th Floor, STE 440 Baltimore,
Maryland 21230-1708

Submitted by:

Frederick County
Office of the County Executive
30 North Market Street
Frederick, Maryland 21701

December 28, 2021



Executive Summary

The submission of this semiannual progress report to the Maryland Department of Environment (MDE) fulfills requirements specified under the Frederick County National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. 11-DP-3321, MD0068357. This will be the County's seventh report on meeting the requirements under the third-generation Phase I NPDES MS4 permit, which went into effect December 30, 2014; expired December 29, 2019; and is currently administratively extended. This progress report covers programs in effect within the annual reporting period for FY21 from July 1, 2020 – June 30, 2021.

Continuing progress has been made in the County's NPDES programs since the Second Half of the FY20 Report was submitted. The sections in this Annual Report follow specific sections presented under Part IV, Standard Permit Conditions, of the County's NPDES Permit to document how required elements of the County's stormwater program are being implemented.

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1 Introduction

The submission of this semiannual progress report to the Maryland Department of Environment (MDE) fulfills requirements specified under the Frederick County National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit No. 11-DP-3321, MD0068357. This will be the County's eighth report under the third-generation Phase I NPDES MS4 permit, which went into effect December 30, 2014; expired December 29, 2019; and is currently administratively extended. This progress report covers programs in effect within the annual reporting period for the FY21 (July 1, 2020 – June 30, 2021).

The County completed the requirements of the third generation permit and continues to excel in stormwater management; long-term watershed monitoring; watershed assessment, restoration and retrofit implementation; developing Geographic Information System (GIS) data; and conducting public outreach activities in accordance with the requirements of the permit. NPDES funding remains adequate to meet the conditions of the permit.

The sections in this Annual Report follow specific sections presented under Part IV, Standard Permit Conditions, of the County's NPDES Permit to document how required elements of the County's stormwater program are being implemented. An introduction to the document is presented in Section 1. Section 2, Permit Administration, provides names, functions, and contact information for all primary administrative and technical personnel, and liaisons responsible for permit compliance as well as an organizational chart (Figure 1 and Figure 2). Section 3, Legal Authority, documents the recertification from the County Attorney that the County possesses the authority to perform NPDES-related activities. Section 4, Source Identification, presents an update on the County's efforts in updating both their GIS data library and their database for tracking new and existing stormwater management facilities. In Section 5, Management Programs, the County presents progress summaries, and updates of several permit management activities, such as erosion and sediment control, illicit discharge detection, spill response, litter and floatables, road maintenance, pesticide/herbicide use, and public outreach. Section 6, Watershed Assessment and Restoration, reports on progress of the County's watershed assessments, references the County's stormwater restoration plan, which addresses Total Maximum Daily Load (TMDL) requirements and impervious area reduction, presents restoration projects by type, and includes public participation comment review periods for County watershed assessments and plans completed in FY19. Section 7, Assessment of Controls, discusses the County's monitoring activities, including the long-term physical, chemical, and biological monitoring program at Peter Pan Run, and monitoring at a land use-specific Best Management Practice (BMP) outfall. Results of this program, along with pollutant load estimates, biological and physical assessment data, and other related information are presented in the report. Section 8 covers program funding in accordance with the County's Operating budget, Capital Improvement Program (CIP) budget, Financial Assurance Plan (FAP), and Watershed Protection and Restoration Program (WPRP) Annual Report. Section 9, Special Programmatic Conditions, reports on activities the County has employed in order to work towards meeting the Chesapeake Bay TMDL and offers a brief status summary of the Water Resources Element.

Similar to the last progress report submitted for the last half of FY20, this will be a data-driven report with the majority of program information included in the accompanying database or as appendices to the main document.

Fifteen (15) appendices have been included in this delivery. Contents of all appendices are available in the digital submission.

All sections of the document have been reproduced electronically and can be found on the accompanying data stick.

2 Permit Administration

In FY21, the Office of Sustainability and Environmental Resources (OSER), within the Office of the County Executive, managed the County's NPDES permit. Additional intercounty personnel are responsible for other various permit components that support compliance with the permit. Staff and their responsibilities related to NPDES permit administration are listed below.



The County Executive's Office is located at 12 E. Church Street, Frederick, MD 21701. OSER offices are located at 30 North Market Street, Frederick, MD 21701.

Office of the County Executive

- Michael Marschner, Deputy Chief Administrative Officer, 301.600.1133
Oversees Animal Control Division, Sustainability & Environmental Resources Office (OSER), Parks & Recreation (DPR), Public Works Division (DPW), Utilities & Solid Waste Management Division (DUSWM). Supports permit compliance programs. Retired December 2020.
- Lori Depies, Chief Financial Officer, 301-600-1753
Oversees Budget Office, Financial Division, Human Resources Division, Interagency Information Technologies Division (IIT), Procurement & Contracting Office, Risk Management Office, Solid Waste & Recycling Division, Sustainability & Environmental Resources Office, Water & Sewer Utilities Division. Supports permit compliance programs.

Office of Sustainability and Environmental Resources, sustainablefrederickcounty.org/

- Shannon Moore, Director, 301.600.1413
Manages Office and oversees permit compliance programs.
- Donald Dorsey, Project Manager IV, 301.600.2952
Supports and manages NPDES activities, Capital Improvement Project development and implementation.
- Jeremy Joiner, Project Manager III, 301.600.1350
Supports and manages NPDES activities, coordinates watershed restoration efforts.
- Angelia Miller, Project Manager II, 301.600.2325
Supports and manages NPDES activities, coordinates Industrial Discharge Permits for stormwater and pollution prevention programs.
- Linda Williamson, Project Manager II, 301.600.1741
Supports and manages NPDES activities and programs, coordinates BMP maintenance projects for stormwater and reforestation efforts.

- Suzanne Cliber, Program Specialist, 301.600.7414
Supports NPDES activities, coordinates watershed restoration efforts related to grants.
- Kim Campbell, Administrative Specialist V, 301.600.1416
Administrative support for the Office of Sustainability and Environmental Resources.
- Christina Lima, Engineering Technician II 301-600- . Supports and manages NPDES Database

Division of Planning and Permitting (DPP), Environmental Compliance Section (ECS)

- Eric Dodson, Engineering Supervisor Environmental Compliance, 301.600.3507
Manages Sediment and Erosion Control Program, supervises collection of information for NPDES permit that includes grading permits and stormwater facility maintenance inspections. Jointly maintains database of stormwater management facilities with Vijay Kapoor.
- Brian Mann, Environmental Compliance Inspector
Manages stormwater facility maintenance inspection database.

Division of Planning and Permitting (DPP), Department of Development Review

- Engineering Specialist III, Maintains database of stormwater management facilities, and reviews stormwater management development plans related to the NPDES permit. Position is currently vacant.
- Vijay Kapoor, Engineering Specialist I, 301.600.1560
Reviews stormwater management development plans related to the NPDES permit. Jointly maintains database of stormwater management facilities, with Eric Dodson

Division of Planning and Permitting (DPP), Department of Planning

- Tim Goodfellow, Livable Frederick, Principal Planner II, 301.600.2508
Coordinates planning activities related to the NPDES permit.

In addition, OSER staff also collaborates with the Division of Utilities and Solid Waste Management (DUSWM), the Division of Public Works (DPW), the Division of Parks and Recreation (DPR), The Division of Emergency Management (DEM), Environmental Health Services Department, and Interagency Information Technologies (IIT) Division.

Permit information is included in the related table PermitInfo of the MDE_NPDES_MS4 geodatabase.

Figure 1 - Frederick County Government Organizational Chart – OSER

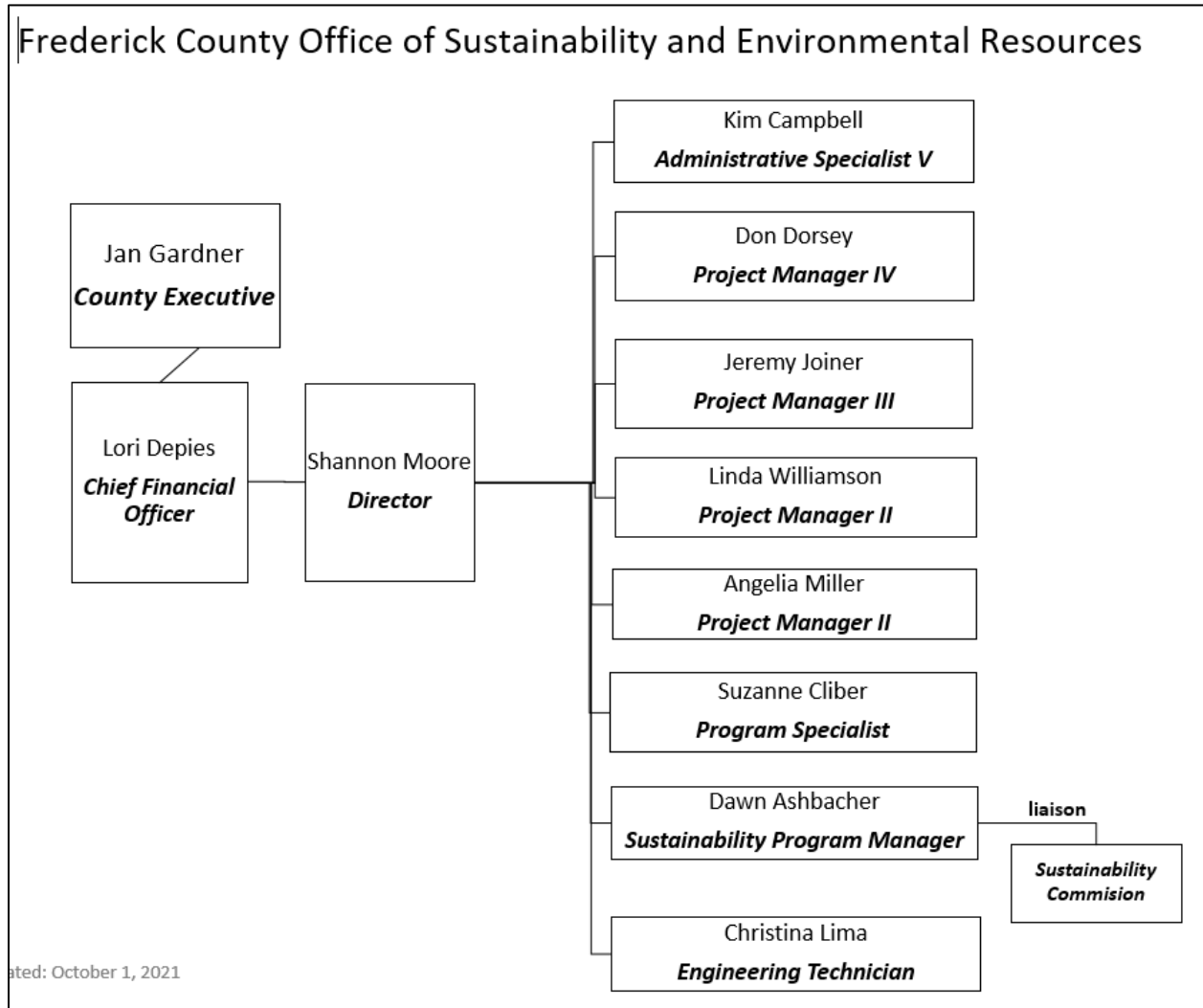
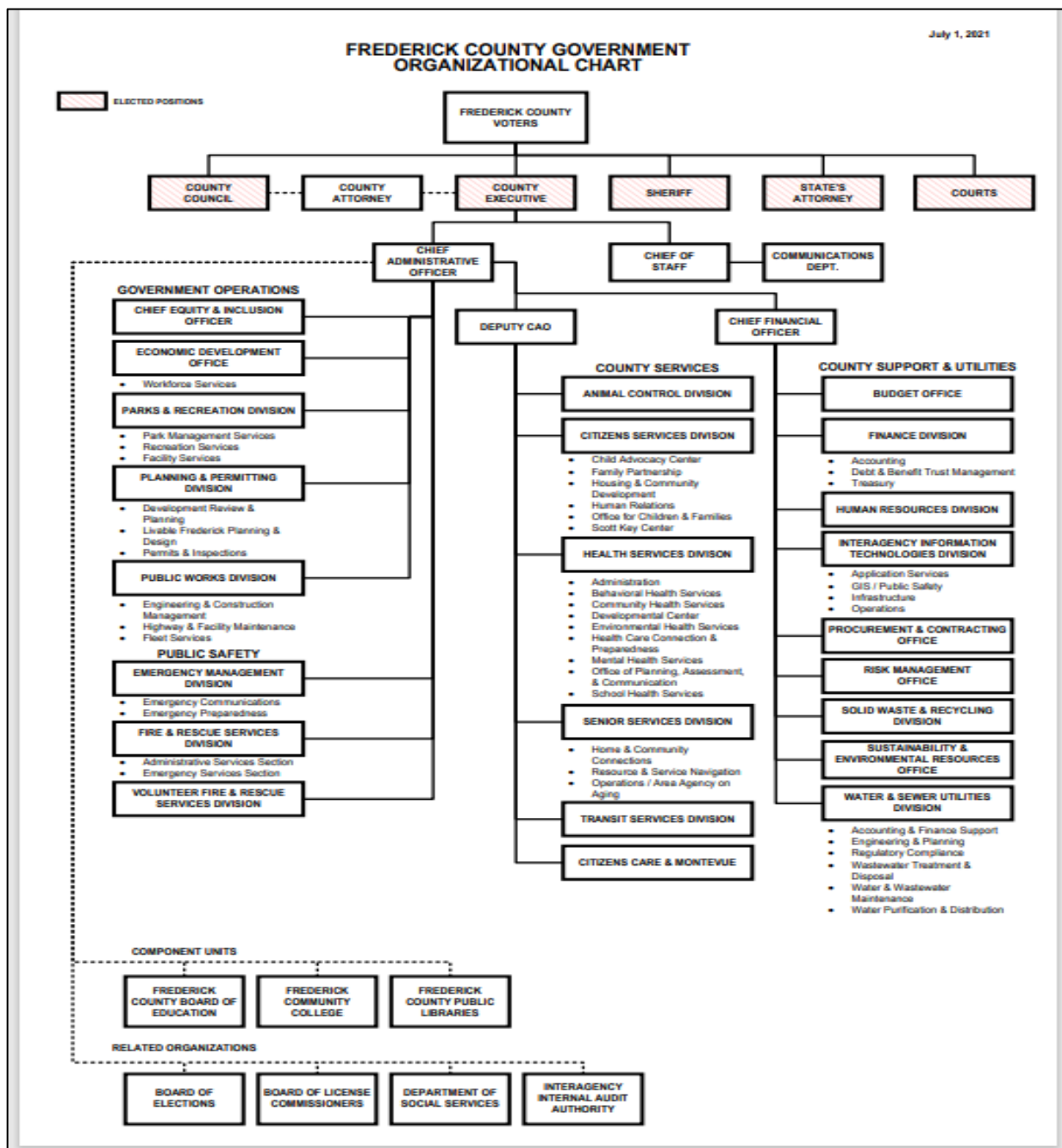


Figure 2 - Frederick County Government Organizational Chart



3 Legal Authority

Appendix A includes a letter from Senior Assistant County Attorney, Kathy Mitchell, certifying that the County has the legal authority to meet the requirements of its permit.

4 Source Identification

This section documents permit-required efforts under Parts IV.C. 1 through 6. Frederick County has collected source identification data on all permit-required topics. The County has a centralized County GIS office within the IIT Division. This approach includes centralized functions such as the development and maintenance of core data layers, development of data standards, system administration, and general oversight of GIS activities countywide. Frederick County GIS distributes countywide base maps and Orthophotography. In addition, Frederick County GIS offers a free GIS data download service that includes GIS Base Data, Orthophotography, Contour-Planimetric Data, and Parcel Data. This service can be found on Frederick County's website, "Download GIS Data".

The Frederick County GIS office continually progresses in enhancing the County's GIS capabilities and in compiling source identification data. OSER, DPP and ECS collaborated with Frederick County IIT and staff to develop and implement digital submission standards for improvement and as-built plan submissions. For further details of the outreach program, see section 5.6.

4.1 Storm Drain System

The County currently maintains a Stormwater System database which includes data for stormwater inventory records for all infrastructure including culverts, storm drains, structures, ditches, outfalls, and ponds. Storm drain system data is contained within the Outfall feature class (1,673 records) and includes related drainage areas, and other related tables. Major attributes that are captured in these tables include IDs, structure characteristics, status, owner, and general comments. In addition to the required feature classes, Frederick County maintains a storm drain and structure inventory, which includes pipes (21,496 records) and structures (22,119 records).

4.2 Industrial and Commercial Sources

A list of the total number of industrial and commercial facilities that the County has determined may have the potential to contribute significant pollutants is included in Appendix B. Information provided in this appendix includes: facility name, company, address, city, state, zip code, respective North American Industry Classification System (NAICS) code, and facility description.

4.3 Urban Best Management Practices

At present, Urban Best Management Practices (BMPs) are included in the MDE_NPDES_MS4 geodatabase. Records for stormwater facilities will be included in BMPPPI feature class and includes associated drainage areas and other related tables. Major attributes that are captured in these tables include structure ID, BMP type, BMP description, and acres treated. New facilities are entered into the database upon approval of the as-built survey.

Frederick County continues to document as-built certifications for all completed BMPs. The County had previously submitted its procedures to MDE on August 28, 2018 in the document entitled, *Frederick County proposed Standard Operating Procedures for use of Alternative Methods for documenting Best*

Management Practices (BMP) built date and determination of water quality treatment for MS4 Permitting Purposes. MDE found the memo to be acceptable in February of 2019. Frederick County continues to use the approach described in its memo. Construction built dates will be determined based on available data described in the following scenarios:

- BMP with no as-built, but with a plan, stormwater management (SWM) report and Construction Completion Forms
- BMP with no as-built, but with a plan and SWM report but no Construction Completion Forms
- BMP with no as-built, but with a plan and no SWM report or Construction Completion Forms
- BMP with no as-built and no plan, SWM report, or Construction Completion Forms
- ESD/Microscale practices not covered by the previous scenarios

4.4 Impervious Surfaces

The MS4 boundary and impervious surfaces have been compiled for Frederick County. Impervious data are included in the MDE_NPDES_MS4 geodatabase table, ImperviousSurface.

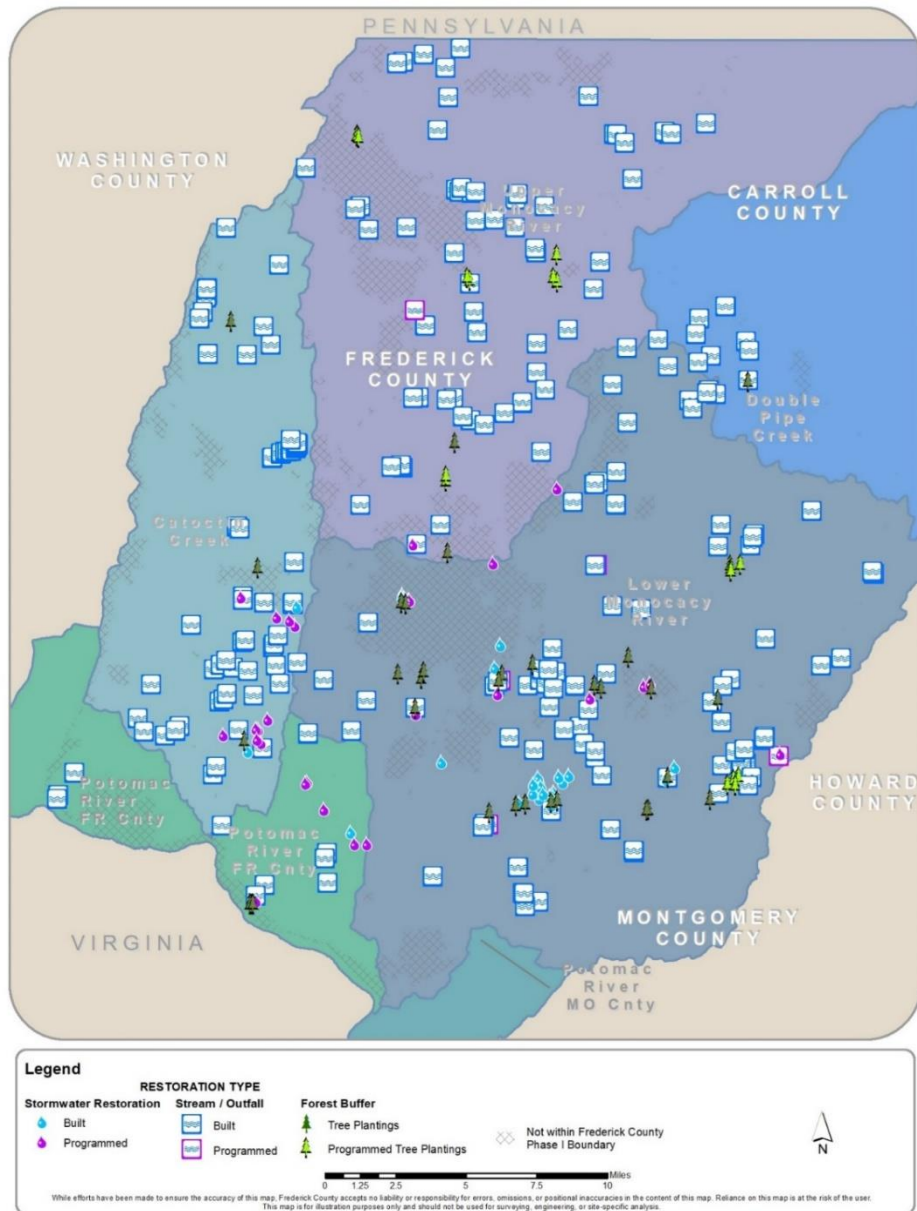
Frederick County Government provided its updated impervious cover analysis with its FY19 Annual Report submission and additional information to MDE in February 2020 to confirm the County's impervious baseline analysis. In March 2020, MDE's draft comments included the acceptance of the County's baseline impervious cover and restoration goal.

4.5 Monitoring Locations

The County maintains and updates, as needed, an inventory of biological and chemical monitoring sites. The data is included in the following tables in the MDE_NPDES_MS4 geodatabase: BiologicalMonitoring, ChemicalMonitoring, MonitoringSite, and MonitoringDrainageArea. Major features that are captured in these tables include site ID, date and time, assessment results (e.g., BIBI/FIBI, habitat scores, water quality measurements), monitoring drainage area, and general comments. Historical data is also provided in the MDE_NPDES_MS4 geodatabase in the tables referenced above.

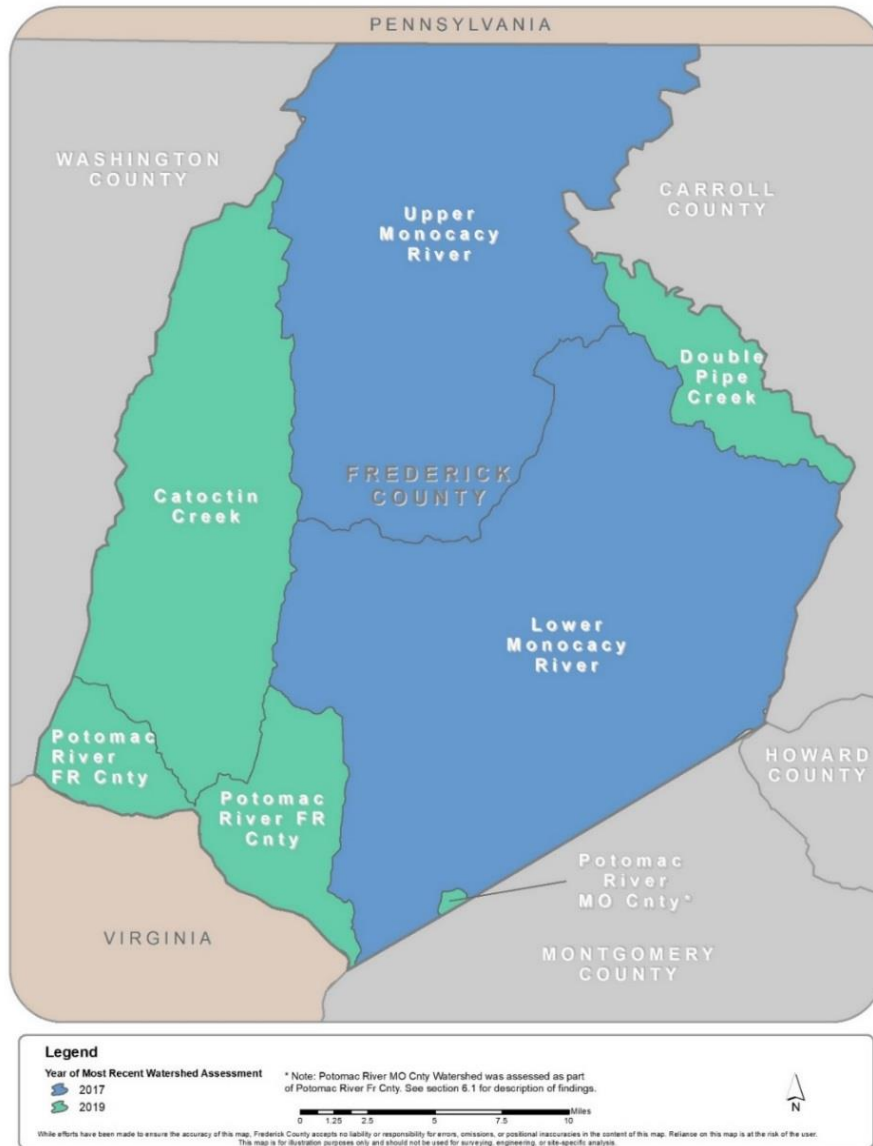
4.6 Water Quality Improvement Projects

The County maintains a geodatabase where water quality improvement projects are identified and tracked. The built and programmed improvement projects are included in the MDE_NPDES_MS4 geodatabase and depicted in Figure 3. Additional information about these projects can be found in the County's Stormwater Restoration Plan and/or the most recent Financial Assurance Plan.

Figure 3 - Watershed Restoration Projects

The County has also conducted watershed studies, identifying, ranking, and grouping potential opportunities within its watersheds. Upper Monocacy and Lower Monocacy watersheds studies were complete in 2017, and the remaining three watershed studies, Catoctin Creek, Double Pipe Creek and Potomac Direct watersheds, were complete in 2019, as shown in Figure 4.

Figure 4 - Watershed Assessment Completed by Year



5 Management Programs

This section documents permit-required efforts under Parts IV.D. 1 through 6. Frederick County continually evaluates its stormwater management programs in an effort to identify and bring about needed improvements as required under its NPDES permit. The County continues to evaluate its progress and effectiveness to control stormwater discharges to the maximum extent practicable (MEP). Current program components, improvements made during the timeframe covered in this report, and plans for future activities, particularly as the County continues to implement management programs under its new permit, are discussed below.

5.1 Stormwater Management Programs

Frederick County maintains its current Stormwater Management Program in compliance with Environmental Article, Title 4, Subtitle 2, Annotated Code of Maryland. The County will continue to do so through plan review and inspection of all developer projects, through implementation of the 2000 Maryland Stormwater Design Manual (Effective October 2000, Revised May 2009; MDE 2000), and through the Stormwater Act of 2007.

5.1.1 Maintenance Inspections of Stormwater Management Facilities

The Department of Permits and Inspections, Environmental Compliance Section (ECS) conducts a program of preventative maintenance inspections of constructed and functioning stormwater management facilities located within Frederick County, and most of its municipalities. Excluded from ECS jurisdiction are facilities located within Frederick City, and within the municipal boundaries of Mount Airy. As required under the County's MS4 permit, the County conducts these inspections on a sequential basis of once within a year after the as-built drawing approval, and then on a triennial basis thereon in perpetuity.

Responsible parties of noncompliant facilities receive notices that outline the failings observed by the inspector, what has to be completed to correct the failings, and a timeframe in which the corrections should be completed. Appropriate follow-up inspections and escalating enforcement techniques are completed, as necessary, until compliance is obtained. Frederick County is continuing to improve the process of enforcement to ensure that owners comply and resolve failing facilities within an acceptable timeframe. Staff within OSER have helped to improve tracking and response in relation to data management. Statistics below aid in showing that the County performs follow-up inspections and coordination to obtain compliance after a facility receives a failing status. ECS has a total number of three inspectors, one of whom is dedicated to managing compliance for all stormwater management facilities within the jurisdiction of the County. The stormwater inspector is responsible for as-built and triennial inspections of BMPs, database management, documentation, and providing support to the development community.

For the fiscal year of FY21, Frederick County's Urban BMP database has 1,911 BMPPOI points and 2,380 related BMP records. Table 1 summarizes the triennial inspections that were completed from 7/1/20 through 6/30/21. Numbers are provided at the site level (BMPPOI) and the individual BMP level (one BMPPOI can have many BMPs). The percentage of triennials performed in relation to the number of facilities that exist within Frederick helps to show that Frederick County is maintaining its requirement to inspect facilities triennially. Percentages are above 25% this year due to the baseline grass swales in the database whose first round of inspections are not due until Fall 2021 (381 facilities) and when facilities were completed. The County also does not have any lapsed inspections, all facilities have been inspected within the last three years.

Table 1 – FY21 Triennial Summary

Description	BMPPOI	BMP
Total number of database records:	1,911	2,380
Baseline grass swales (OSER)	381	381
ECS Triennial Requirement	1,530	1,999
Number of triennials performed in 2021	376	533
Percentage of facilities receiving a triennial 2021	25%	27%

In Frederick County, ECS inspects facilities at the site level (BMPPOI), if one of several BMPs at a site fails, the entire site is considered failing. As of November 2021, Frederick County had addressed all but 3 failing triennials from FY20. Table 2 provides a summary of the failing and remediated BMPInspections records that can be queried from the database and **Error! Reference source not found.** provides details for failing inspections for FY21. There are currently 3 outstanding failing facilities for FY21 or previous years and are detailed in Table 3.

Table 2 - Failing Inspection Counts FY21

Description	Count
Number of BMPInspections records failing their initial triennial inspection within FY21:	43
Number of BMPInspections records failing their initial triennial inspection within FY21 and remediated by the time of reporting:	39
Number of MDE BMPInspections records failing their initial triennial in the current fiscal year and still failing:	4
Number of MDE BMPInspections records failing their initial triennial in previous fiscal years and still failing:	0

Table 3 – Details for failing inspections for FY21

BMP	Fail Date	Status	Comments
Mare Property Wet Pond (108)	3/4/2021	County is currently in the process of gaining compliance	The County has not been able to identify/contact the responsible party after several repeated attempts. The efforts will continue until the facility is in compliance.
Boyers Mill Rd. Bridge (109657)	2/8/2021	County is currently in the process of gaining compliance	This is a County owned and maintained facility that was recently rebuilt following a failed as-built inspection. The facility is not draining as designed and is currently being investigated as to potential causes. The facility is structurally sound and runoff is

			able to convey into and out of the facility.
Jefferson District 4 Yard (871)	10/27/2020	County is currently in the process of rebuilding the failing underdrain system	This is a County owned and maintained facility that is in the process of being rebuilt due to a failing underdrain system. The repairs will be completed as part of a County funded CIP project with a start date projected in the Spring of 2022. The facility is structurally sound and runoff is able to convey into and out of the facility.
Allied Plywood (517)	1/26/2021	Currently working on rebuilding their underground facility	The County has been in contact with the property owner in an effort to rebuild the facility to meet the current specifications.

All inspections are recorded within a proprietary Permitting and Development Review application, Infor – an upgrade from the previous software that occurred this past year. The appropriate data is exported from the database using select and parameter queries from an outside data management software. The subsequent data is then imported into the geodatabase, with a GEN_COMMENT to assist in identifying relevant FY21 inspections. Inspection data stored in the BMPInspections table represents all triennial inspections for the stormwater management program, including those outside the reporting term.

5.2 Erosion and Sediment Control

Frederick County's Erosion and Sediment Control Program is administered by the Department of Permits and Inspections, Environmental Compliance Section (ECS). ECS utilizes inspectors that are specifically knowledgeable in Environmental Compliance inspection and enforcement to maintain an acceptable Erosion and Sediment Control Program in accordance with Environment Article, Title 4, Subtitle 1, Annotated Code of Maryland. The County's program was evaluated by MDE on October 23, 2019 and has been granted delegation of authority effective through June 30, 2022

ECS continues to receive budgetary support for equipment and automation, such as:

- Four-wheel-drive (4WD) vehicles,
- Full mobile connectivity through use of Dell rugged tablets for field work,
- iPhone mobile cell phones with hard cases, and
- Hands-free devices are also provided for in-vehicle use.

Continued program enhancements include:

- Division of Planning and Permitting (DPP) engineering and inspection staff working closely with the local Soil Conservation Districts (SCDs) to conduct a joint approach to sediment control and stormwater management plan review. The mutual efforts to obtain Environmental Site Design to the Maximum Extent Practicable (ESD to the MEP) should prove successful in producing better designed plans.
- DPP, and the County in general, striving to improve relationships with builders, developers, and related professionals by providing an open and interactive process in which every opportunity is given to receive input on ways to improve or enhance programs.
- ECS taking part in quarterly Permitting Outreach Meetings to establish relationships with the development community, and to inform and discuss permit processes and ESD practices.
- DPP and ECS collaborating with Frederick County IIT and OSER staff in quarterly Development Review Outreach Meetings to implement digital submission standards for improvement and as-built plan submissions. For further details of the outreach program, see section 6.3.
- The Engineering Supervisor/Environmental Compliance attending weekly meetings with the Permits and Inspections (P&I) Director, Permits Services Manager, and fellow Chief Inspectors of other disciplines. This interaction provides input and feedback from all parties and has proven to be extremely helpful and beneficial.
- Continuing to meet the needs of the state and the expectations of its citizenry to be environmentally sensitive and proactively protective of our natural resources; and
- Participating in professional development opportunities through seminars and workshops, hosted by MDE.
- As of December 2019, the County implemented a new Land Management Software System that streamlined and expedited the plan review and permitting process with the added benefit of being entirely paperless.

Erosion and sediment control data for FY21 are included in the MDE_NPDES_MS4 geodatabase. Related tables include ErosionSedimentControl and QuarterlyGradingPermits. Major features that are captured in these tables include ID, contact information, permits issued/active, number of inspections, number of fines, number of violations, and general comments.

5.2.1 Responsible Personnel Certification Classes

As originally reported in Frederick County's 2015 Annual Report, MDE confirmed that the RespPersonnelCertInfo table reporting requirement is eliminated.

5.2.2 Construction Site Data

Frederick County ECS provides quarterly reports of all grading activities disturbing more than one acre to MDE to cross reference against their NOI records. The data submitted includes site name, site owner and address, the amount of disturbed area, the local grading permit number, site location, and the type of development (e.g., residential, commercial, etc.).

Evaluation: Frederick County's Erosion and Sediment Control program is well established and is constantly striving for improvement. The County's goal is to establish itself as a model for which the State, other delegated jurisdictions, and its citizens may be proud. Frederick County continues to work closely and cooperatively with the local SCD and MDE. The cooperative nature of that relationship has resulted in several policy discussions designed to improve and enhance the sediment control program. Through its quarterly reports, the County met requirements for the electronic reporting of earth disturbances in the period of 7/1/20 to 6/30/21.

5.3 Illicit Discharge Detection and Enforcement Program

Frederick County continues to implement its Illicit Discharge Detection and Enforcement (IDDE) Program. The County's IDDE Program identifies potential illicit discharges in several ways: (1) through a systematic screening approach of outfalls that are more likely to demonstrate an elevated risk of illicit discharge, based on land use characteristics (the majority of sites were identified by this proactive approach); (2) through on-call (episodic) dry weather screenings of outfalls completed as a result of outfalls identified during as-built inspections, triennial maintenance inspections, or other County field work; (3) visual surveys of parcels with industrial and commercial land uses (hotspot surveys); and (4) through citizen and agency reporting mechanisms such as non-County agencies reporting spills to the National Response Center (NRC).

A complete report of Frederick County's Illicit Discharge Detection and Elimination Program from 7/1/20 to 6/30/21, including screening methods and results, is included as Appendix C.

5.3.1 Systematic Outfall Field Screening

Using the new protocol submitted on December 29, 2017, the County contracted with KCI Technologies, Inc. to conduct IDDE screenings (i.e., physical inspections and water quality testing) during the reporting period. In accordance with the revised protocols, field inspectors noted evidence of dry weather flows, if present, at all outfalls selected as target sites, as defined below.

If flowing water was present in the network, under otherwise dry conditions, inspectors documented conditions relevant to the discharge, and sampled the effluent for a defined set of chemical constituents, including ammonia, conductivity, detergents, phenols, pH, copper, and chlorine. Detergents, phenols, copper, and chloride are tested using a Hach Storm Drain Test Kit; ammonia is tested using a separate Hach test kit for Ammonia-nitrogen; conductivity and pH are measured using a multiparameter probe. If analytical results or field inspections indicated potential illicit connections, the conveyance network contributing to the outfall, and surrounding areas were investigated to identify possible sources of pollution. A follow-up sampling event was conducted within 24 hours to retest the parameters that had

exceeding screening criteria in the initial test. If the second assessment also indicated test results out of the accepted ranges, KCI staff alerted County personnel via a written report of the findings. County staff then contacted the landowner or responsible party regarding the violation and the corrective actions.

In the 2021 reporting period, the following areas within the County were targeted for systematic screenings: Thurmont, Walkersville, and areas along Buckeystown Pike, and Emmitsburg. These screenings prioritized selected hotspot locations for the visual surveys that were identified as new locations for surveying or were reported in FY17 as having hotspot violations for their triennial inspection. A total of 103 outfalls were screened within these areas.

Data pertaining to Frederick County's IDDE program are included in the IDDE table in the MDE_NPDES_MS4 geodatabase.

5.3.1.1 Results of *Systematic Outfall Field Screening*

Summaries of KCI's screenings are included in the Illicit Discharge Detection and Elimination Program report in Appendix C.

5.3.2 Episodic Outfall Field Screening

If dry weather flow is noted at an outfall during any other County activity, such as Stormwater Management Structure "As-Built" inspections, triennial maintenance inspections, or watershed assessments, the County's Office of Sustainability and Environmental Resources (OSER) is notified within 24 hours. OSER then conducts an IDDE screening in the same manner as that detailed above in section 5.3.1, and in *Frederick County's Illicit Discharge Detection and Elimination: Response, Inspection, and Reporting Protocols* (KCI Technologies, Inc., 2017).

During 2020-2021, there was 1 report of identified flowing outfalls through the County's episodic inspection program. Results of episodic screenings are included in the Illicit Discharge Detection and Elimination Program report in Appendix C.

Data pertaining to Frederick County's IDDE program are included in the IDDE table in the MDE_NPDES_MS4 geodatabase.

5.3.3 Citizen and/or Agency Reporting

Information about how citizens can report illicit discharges is available online on Frederick County Government's Citizen Request Tracker web page under "Water Pollution Issues":

<http://www.frederickcountymd.gov/requesttracker.aspx>

A reporting link is also available at:

<https://www.frederickcountymd.gov/reportwaterpollution>

During the 2020–2021 reporting period, 6 potential illicit discharges were reported to the County through external reporting mechanisms. Potential illicit discharges were investigated and resolved using Frederick County staff, MDE, and other state agencies. Summaries of the reports can be found in the IDDE Annual Program Report included in Appendix C.

5.3.4 Commercial and Industrial Facility Inspections

Frederick County staff inspected twenty six (26) selected facilities during the reporting period. Assessment conclusions determined that there were two (2) facilities found to not be in service and therefore not a hotspot. Twenty (20) parcels received marks to qualify as hotspots but with no violations (**Error! Reference source not found.**). The states of the remaining four (4) parcels indicated several specific infractions or active polluting conditions and were identified as hotspots with violations (Table 4).

As of December 2020 all four (4) of the facilities have resolved the identified concerns. Results and follow up documentation can be found in Appendix C.

Table 4 - Facilities found to be a hotspot with violations

Business Name	Address	Inspected	Notes
Chubby's Barbeque	16430 Old Frederick Road #A	9-September	Used cooking grease buckets with evidence of spill.
Rube's Crab Shack	17308 North Seton Ave	9-September	Pollution source was grease container scheduled for removal.
McDonald's - Buckeystown	5203 Buckeystown Pike	18-September	Black staining along curb line leading to storm drain. No active violations occurring but staining warrants follow up.
K & K Automotive	5850 Urbana Pike	11-September	Nuisance Waste and exposed bucket with green liquid material.

5.3.5 Spill Response

In FY21, Frederick County continued to respond to all citizen complaints of illegal dumping and spills, as part of the County's overall Illicit Discharge Detection and Elimination program. OSER has developed a standard set of procedures that maintain consistency in reporting and referrals for minimal internal transfers, as part of the County's IDDE protocol. If a spill occurs within the MS4 boundary, and is not a hazardous material, sanitary sewer overflow, or septic system discharge, OSER will respond to the event and direct the property owner or responsible party on proper reporting and remediation measures. Follow-up inspections are conducted with varying timeframes based on the severity of the spill, documented internally, and reported to MDE, as necessary. Any spills reported to OSER are described above in section 5.3.5.

Hazardous spill calls are forwarded to 911, where first responders are trained and equipped to handle such situations. For hazardous spills requiring evacuation, the Department of Emergency Preparedness has updated its Emergency Operation Plan, which includes annexes for emergency evacuation; triggers, escalations and evacuation plans; and HazMat response. The County also has a reverse 911 system to perform targeted calling based on georeferenced locations for localized problems like hazardous spills. The Fire Department coordinates the Local Emergency Planning Committee, required under the Superfund Amendments and Reauthorization Act (SARA) Title III.

Spills are also reported to the National Response Center (NRC). OSER will only report spills to the NRC with the understanding that the responsible entity has not already done so or plans to do so. Records for Frederick County in the second half of FY20 are included in the table below due to the database provided online being down at the time of the second half year report. Records for Frederick County in FY21 are also included below (Table 5; USCG, 2020 & 2021).

Table 5 - Reported Spills in Frederick County Second Half of FY20 & FY21

Date	Reported By	Address	Material Spilled	Suspected Party	Notes/Comments from NRC
4/28/2020	National Response Center	5993 Ladd Ct – Apt F	Oil	Unknown	Caller reported the neighbors car is leaking motor oil onto the ground.
9/13/2020	National Response Center	Pecking Stone St	Hydraulic oil	Unknown	Caller is reporting that there is a piece of construction equipment that is leaking hydraulic oil onto the ground. Caller also states on sept. 12, at 2000hrs, he noticed some hydraulic oil on the ground near the same area.
10/23/2020	National Response Center	15 Woodside Ave	Animal Waste	Dumping	Caller states the suspected responsible party (srp) breeds animals, such as rats and snakes, in bins and they continuously wash out the bins and allow the run-off of feces and urine to go into a nearby creek. This has been ongoing for a year. Caller also suspects water supply contamination as a result of this incident.
11/9/2020	National Response Center	100 S Maple Ave	Crude sulphate turpentine	Unknown	Caller is reporting they had a vapor release of crude sulphate turpentine from a rail car into the air, due to an unknown cause.
3/13/2021	National Response Center	797 E Patrick Street	Fuel	Home Owner	Caller reported a home heating oil tank released diesel fuel on the ground and surrounding storm

Date	Reported By	Address	Material Spilled	Suspected Party	Notes/Comments from NRC
					drains when it was loaded on a farm vehicle trailer. Caller stated the fuel spilled for about 2 to 3 miles away from the incident location.
3/25/2021	National Response Center	6766 English Muffin Way	Unknown Oil	Vehicle	Caller reports that a ups service facility has multiple vehicles that are parked on unpaved areas at the incident location. These vehicles seem to be leaking unknown oils onto the soil and grass.
6/30/2021	National Response Center	601 W Main St	Black Mold & Asbestos	Owner	Caller reported black mold is covering multiple locations inside of an apartment complex. Caller stated they have numerous health impacts as a result of the mold inside of the building. Caller also said portions of the building are breaking down including the outside brick wall. Caller also asbestos are also being released inside of the complex. Caller stated several residents have mold inside of their lungs. Caller has numerous pictures of the incident location. Caller stated this is historically designated building.
9/13/2020	National Response Center	Pecking Stone St	Hydraulic oil	Unknown	Caller is reporting that there is a piece of construction equipment that is leaking hydraulic oil onto the ground. Caller also states on sept. 12, at 2000hrs, he noticed some hydraulic oil on the ground near the same area.

Date	Reported By	Address	Material Spilled	Suspected Party	Notes/Comments from NRC
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3/13/2021	National Response Center	797 E Patrick Street	Fuel	Home Owner	Caller reported a home heating oil tank released diesel fuel on the ground and surrounding storm drains when it was loaded on a farm vehicle trailer. Caller stated the fuel spilled for about 2 to 3 miles away from the incident location.

Source: (USCG, 2020, 2021)

5.3.6 Program Evaluation

Frederick County's Illicit Discharge Detection and Elimination program continues to put forth effort in identifying, eliminating, and documenting potential illicit discharges. The Office of Sustainability and Environmental Resources fulfilled its permit requirements for FY21: 104 dry weather screening inspections and 1 episodic inspection for a total of 105 outfall screening inspections conducted to meet the 100 outfall requirement. In addition to systematic and episodic screenings, ECS continues to check for dry weather flow at their triennial stormwater inspections. Overall, 26 businesses were screened through the visual surveys of parcels with industrial and commercial land uses; and six citizen reports of violation were investigated and eliminated.

Data for Frederick County's IDDE program are included in the IDDE table in the MDE_NPDES_MS4 geodatabase.

5.4 Litter and Floatables Annual Report

Frederick County recognizes that increases in litter discharges to receiving watersheds have become a growing concern within Maryland. The County has evaluated current litter control programs, potential sources, and methods for elimination and opportunities for improvement. The County also has enhanced its public outreach program to address Litter and Floatables issues.

5.4.1 Potential Sources

An Assessment of Potential Sources was completed for the 2015 half-year Annual Report. An assessment of data from several sources, to include Stream Corridor Assessments (SCA); restoration monitoring; and the Frederick County Stream Survey, determined that trash problems are not present along the entire lengths of stream networks in Frederick County, but instead may be attributed to trash “hotspots,” or dumping sites since the problems are present in isolated locations. The dumping sites that received a severe trash rating in the SCA were located within agricultural, resource conservation, low density residential, and village center land use types.

5.4.2 Methods for Elimination

Based on the 2015 Assessment of Potential Sources, OSER staff uses the following strategies as methods to eliminate litter and floatables throughout Frederick County’s MS4:

- Public Outreach Program; and
- Litter Control Programs

5.4.3 Public Outreach Program

In order to address litter control problems, and to develop a litter and floatables public education and outreach program in Frederick County, OSER is following the goals and objectives from The Strategic Plan to Improve Water Quality through Public Outreach in Frederick County, Maryland, published in November 2003. As part of litter prevention outreach, OSER staff is working with and supporting organizations that provide outreach and coordinate large and small-scale cleanups in Frederick County.

Developed in 2015, Frederick County’s ongoing litter and floatables public education and outreach program includes the dissemination of outreach materials to the public that communicate the level of trash in Frederick County’s streams, discourage littering behavior, and encourage individuals or groups to participate in trash cleanups. OSER staff developed materials specific to Frederick County and has incorporated additional litter prevention outreach materials into current outreach efforts required under the public education section of the permit (PART IV.D.6). Additional education and outreach are being implemented through print and digital media, advertisements, press releases, newsletter articles, and a resource webpage with the promotion of local trash cleanup events to encourage public participation. OSER staff has developed an online webpage at <https://www.frederickcountymd.gov/7564/Litter-and-Floatables> to be used as a resource for promoting participation in existing trash cleanup events and coordination of new cleanups, and for educating the public on litter prevention in Frederick County. The webpage includes links to the websites of other organizations who host cleanup events, such as the Alice Ferguson Foundation.

The Alice Ferguson Foundation (AFF) has developed a Regional Litter Prevention Campaign toolkit as part

of their Trash Free Potomac Watershed Initiative. The Regional Litter Prevention Campaign toolkit contains resources available for Frederick County to use for the County's public education and outreach program. The toolkit materials include advertisements and visuals, communication pieces, and community outreach pieces. OSER staff uses materials from the AFF toolkit that are appropriate for Frederick County's outreach efforts to reduce littering.

The Green Leader Challenge, one of 3 sub-challenges that make up the overall Green Homes Challenge, helps County residents adopt environmentally friendly practices. In the Green Leader Challenge, there are eleven (11) actions that educate and motivate Challenge participants to eliminate waste and litter, recycle, and compost. To date, nearly 2,399 individuals have registered with the overall Green Homes Challenge and 327 are self-certified as Green Leaders.

The Frederick County Department of Solid Waste Management (DSWM) coordinates a recycling education and outreach program that promotes recycling through community engagement, print and digital media, school presentations, and special events. The County has an overall recycling and waste diversion rate of 53.51% (MDE's County Recycling Rates by Commodity in Tons for Calendar Year 2019 from [2019 County Commodity Chart.pdf \(maryland.gov\)](https://www.maryland.gov/2019/05/20/2019-County-Commodity-Chart.pdf) and has established a goal of achieving a 60% waste diversion rate by 2025. Fluctuations in the international recycling market can affect this rate. Four times per year, DSWM sends out useful information on the County's recycling program, including important updates, interesting facts, and tips for creating less waste. The Department of Solid Waste Management has information available on its website <http://www.frederickcountymd.gov/5634/Waste-Management-Trash-and-Recycling> for County residents on various landfill programs, such as disposal of household hazardous wastes, recycling, source reduction, and backyard composting. The continuation of current efforts in this program will be sufficient in meeting the permit requirements for recycling education and outreach, and achieving the County's recycling goals.

Recycling Outreach (conducted by the Recycling Outreach Program Coordinator under DSWM) is ongoing and includes:

- Community Engagement: meet with community groups and provide presentations; present displays at public events
- Digital Media: Facebook; e-newsletter; mobile app (Recycle Coach)
- Print Media: direct mail; newspaper and other advertising media (bus, billboard, etc.); press releases; articles for publications
- Schools: work directly with Frederick County Public Schools (FCPS) to increase awareness among staff and students of waste and recycling issues; include private and home schools in any contests or promotions
- Special Events: conduct contests, drop-off events, award programs and other campaigns to bring attention to and increase support of County programs and goals

The first phase of the Solid Waste Management Options Study was initiated to develop a long-term solid waste management strategy that is informed by and inclusive of county residents. Frederick County's Solid Waste Steering Committee held a series of workshops between November 2015 and February 2016 collectively called the "What's Next? Solid Waste Public Forums". The framework for evaluating the options generated by the public was built around criteria in the Maryland Recycling Act and Zero Waste Plan. Options recommended for analysis in phase 2 of the study include:

- Waste reduction program at county schools – Collecting food waste for composting,

increasing recycling efforts, etc.

- Three-bin system for collection – waste collection would separate trash, recycling, and food waste.
- Food waste collection from restaurants – Commercial food waste would be collected for composting.
- Community-scale, decentralized composting program – Food waste and other organic material would be collected for composting at small facilities. This could serve as a pilot for a large-scale operation.
- Development of a large-scale, centralized composting facility – A central countywide facility would process separated organic materials: primarily food waste, yard waste, and non-recyclable paper.

During Phase 2 of the study, a detailed analysis was completed of the viability of each recommended option from Phase 1, both individually and in combination with other appropriate options. The Phase 2 Report was completed (issued) June 30, 2017. Prior to completion, the Phase 2 Report was presented at a County Executive Town Hall meeting on June 2, 2017 and to County Council on June 27, 2017. Findings from the Phase 2 report will serve as a roadmap for the county to achieve recycling and waste diversion goals over the next ten years. The County's Solid Waste Management Plan 2018-2037 is available from <https://www.frederickcountymd.gov/DocumentCenter/View/295281/-Reformatted-DRAFT-SWMP-2018-2037?bidId=>

5.4.4 Litter Control Programs

The following litter control programs throughout Frederick County are presented below.

- Alliance for the Chesapeake Bay “Project Clean Stream” – Postponed due to COVID-19. The event is an annual watershed-wide effort to clean up trash.
- Adopt-a-Road Program – **Ongoing**
 - The Office of Highway Operations coordinates an “Adopt-a-Road” Program to help control litter along County roads. Approximately 83.85 miles of road are maintained by 40 groups across the County. From July 2020 through June 2021, a total of 4.46 tons of trash and 36 tires were removed through this program.
- Road Maintenance Activities - **Ongoing**
 - The Office of Highway Operations removed a total of 21.87 tons of trash and 446 tires from July 2020 through June 2021. The Office of Highway Operations also conducts street sweeping and inlet cleaning.
- Frederick County Health Department Nuisance Waste Ordinance – **Ongoing**
 - According to the nuisance waste ordinance, Frederick County's Health Department enforces illegal dumping that is reported by citizens or through OSER's IDDE program protocol.

5.5 Property Management and Maintenance

5.5.1 Municipal Facilities

There are eleven (11) Frederick County-owned and operated facilities that are currently covered by the 12-SW General Permit for Discharges from Stormwater Associated with Industrial Activities (Table 6). All eleven facilities currently have Stormwater Pollution Prevention Plans (SWPPPs) that are continuously updated by SWPPP team members through redline edits. The identified SWPPP team members also perform quarterly inspections, and visually monitor the outfalls associated with the BMPs on their

property. Annual trainings are presented through an online learning platform throughout the first half of the fiscal year or in person in October or November. Spills are reported and documented internally and MDE is notified as required. Coordination of the 12-SW permit and its requirements are directed by OSER staff as of 7/1/2018.

On December 7, 2018, MDE issued a final determination for a modification to the General Permit for Discharges from Stormwater Associated with Industrial Activity. It is now identified as General Permit 12-SW-A with an expiration date of December 31, 2018, and has thereby been administratively extended until a renewal permit can be drafted and issued.

Table 6 - Notice of Intent (NOIs) with Permit Coverage through December 31, 2018

Facility Name	Permit Number	NOI Submitted	SWPPP Developed	SWPPP Complete	SWPPP Inspections Complete
Jefferson Copperfield Wastewater Treatment Plant	12SW2283	Yes	Yes	Yes	Yes
Ballenger McKinney Wastewater Treatment Plant	12SW1878	Yes	Yes	Yes	Yes
Reich's Ford Landfill	12SW2366	Yes	Yes	Yes	Yes
331 Montevue Lane (Frederick) Highway Operations Yard	12SW1890	Yes	Yes	Yes	Yes
Thurmont Highway Operations Yard	12SW1892	Yes	Yes	Yes	Yes
Johnsville Highway Operations Yard	12SW1891	Yes	Yes	Yes	Yes
Myersville Highway Operations Yard	12SW2285	Yes	Yes	Yes	Yes
Jefferson Highway Operations Yard	12SW2291	Yes	Yes	Yes	Yes
Urbana Highway Operations Yard	12SW1893	Yes	Yes	Yes	Yes
Law Enforcement Center	12SW1942	Yes	Yes	Yes	Yes
Transit	12SW1888	Yes	Yes	Yes	Yes

This Annual Report SWPPP appendix contains the reporting documents from FY21, including quarterly inspections, annual training sign-ins from in-person training as well as logs from online training, spill response forms, and other relevant data (Appendix D).

Data in relation to industrial facilities managed for stormwater can be found in the Municipal Facilities feature class in the MDE_NPDES_MS4 geodatabase.

5.5.2 Road Maintenance Activities

During FY21, Frederick County continued to implement recommendations from its 2002 Assessment of Road Maintenance Activities (Versar, 2002). The objective of this study was to assess the effects of road maintenance activities on stormwater runoff and resulting impacts on surface water quality. The assessment evaluated current practices, analyzed alternative practices, and presented a plan to incorporate alternative practices into the County's road maintenance programs. Members of the County's Office of Highway Operations provided data and information on current practices and plans of the Department. Activities included in the evaluation were chemical usage in snow and ice removal, herbicide spraying for vegetation control, street sweeping, litter control, road surface maintenance, and maintenance of unpaved surfaces. The assessment report was submitted to MDE on June 11, 2002 and

was found to meet NPDES permit requirements for developing a plan to reduce pollutants associated with road maintenance activities.

The County continues to move ahead with several of the recommendations developed in the June 2002 evaluation report. The activities that the County Office of Highway Operations undertook during the reporting timeframe of 7/1/20 through 6/30/21 to reduce runoff pollution were:

1. **Street Sweeping:** Street sweeping was conducted in FY21. A total of 718 lane miles of road were swept totaling 146 tons of debris removed from roads in Frederick County during FY21. All curbed roads are swept at least once a year with some roads up to four times a year. All sweeping is conducted using a vacuum-assisted truck. Frederick County prioritizes closed-section main roads to be swept first followed by roads in developments. Once all sections are swept, the sweeping starts over with closed section main roads, etc. Complaints also drive prioritizations. In addition to complaint-driven sweeping, Highway Operations proactively sweeps bridge decks and other areas after deicing activities. When the Office of Highway Operations receives a complaint, the complaint is logged into a work order system and assigned to a foreman, and work is performed. Citizens either directly input complaints into the system through a link on the County's Highway Operations Department website; or, the Office of Highway Operations secretary receives calls and enters information into the work order request system. Street sweeping data is recorded by the districts. Lane Miles, Cubic Yards, Landfill Fee, and Landfill Weight by watershed are captured in reports from Highway Operations. Specific weight information by watershed is available from October 2015-present while quarterly weight totals can be derived since January of 2015. Crediting of the street sweeping method for MS4 compliance by Frederick County is done utilizing the Frederick County Street Sweeping Program: Reporting Methodology prepared by Versar in 2012 and approved by MDE via email on February 1, 2019.
2. **Deicing:** Caliber M1000, which is a 30% Magnesium Chloride solution with an agricultural by-product, is used in 48 of the County's trucks when the temperature is ≤ 25 °F. The trucks are equipped with tanks that range from 90-120 gallons that apply the solution onto the salt mixture as it is spread onto the road. Overall, the County has 51 full-sized, ten-ton dump trucks and 14 smaller, one-ton dump trucks for deicing. The Caliber M1000 makes the salt mix more effective and reduces corrosion. The County does not use M1000 for de-icing at temperatures above 25 °F. The M1000 is also sprayed onto the salt to pre-treat the roads, if the timing and conditions warrant.

According to product literature for Caliber M1000 (<http://www.innovativecompany.com/products/winter-liquid-enhanced-liquid/caliber-m1000>):

"As a pre-wetting agent for salt and sand, Caliber M1000 reduces bounce and scatter, increases the speed at which the salt begins working, increases the melting capacity of the salt, and permits the use of salt at lower temperatures. Additionally, Caliber M1000 also reduces corrosion, inhibits crystal formation and product fallout at lower temperatures, and improves roadway traction when compared to other liquid products."

The use of deicers in FY21, by MDE watershed, is presented in Table 7 for Highway Operations. A total of 16,404 gallons of liquid deicer (Caliber M1000), 20,506 American standard tons of road salt (consisting of over 98.5% sodium chloride by weight), and 525 American standard tons of anti-skid were used within the watersheds. Prior to 2009, Highway Operations used cinders instead of

anti-skid. The switch to anti-skid was the result of the suspension of distribution of bottom ash for winter road treatment in order to conform to the Maryland Coal Combustion Byproducts (CCB) regulations. These regulations prohibit placement of CCBs in areas other than approved disposal facilities. As a result, Highway Operations began using an anti-skid material purchased from local quarries. It is a small, uniform size stone that contains very little dust/fine material. Thus far, the material has been working well. Starting in December 2008, one of the objectives of Highway Operations was to use more liquid deicer in an attempt to use less salt. They are also pre-treating the roads, whenever appropriate, to apply material under the snow/ sleet / ice layer so that frozen precipitation cannot bond to the road, which should result in a significant reduction in materials used. In addition, Highway Operations developed and implemented a Salt Management Plan to provide a framework to deliver safe, efficient roadway systems during winter storm events in a cost effective and environmentally sensitive manner.

In its review of the 2016 Annual Report, MDE, “requests that the County provide an assessment of how de-icing procedures are reducing the application of salt during winter weather.” Frederick County responded in 2016 to a similar request and had examined whether the use of deicer (Caliber M1000) reduced the amount of road salt used during snow events. There did not seem to be a clear pattern in the use of these two techniques over time, in relation to the total amount of snowfall recorded in the County for the year. Additionally, Caliber was quite expensive. The County found that pretreatment with the brine allowed the County to use significantly less granular salt. The County invested significantly in this equipment after the end of FY17 and continues to implement brine technology during storm events.

Table 7 - Office of Highway Operations Use of Deicers by Watershed – 2021

Watershed	Gallons of Liquid Caliber (M1000)	Tons of Road Salt	Tons of Anti-skid
Catoctin Creek	4960	4574.5	181
Double Pipe Creek	138	746	24
Lower Monocacy	5569	7833.5	78.5
Lower Mon/Upper Mon		228	0
Potomac	2105	857.5	0
Upper Monocacy	3632	5657	152
UM/LM	4960	372	0
Total	16133	24291	525

3. Inlet Cleaning: All Highway Operations foremen began reporting inlet-cleaning statistics in 2004. A total of 485 inlets were cleaned in FY21. Inlet-cleaning statistics are reported in the quarterly reports under Drainage. Prioritization of inlet/pipes cleaned by the County are complaint-driven, using the same mechanism to report issues as street sweeping noted above. For more information, a written SOP was provided in the FY19 annual report and approved by MDE. In addition to inlet cleaning, stormceptor cleanings are performed on a regular basis. Approximately 1/3 are cleaned each year by contractors for the County.

4. Data Collection: Reports were collected quarterly from district foremen and submitted to the department head. At the end of 2009, data collection improvements were made to better track application of snow removal materials as discussed above under “Deicing”.
5. Reducing the Use of Pesticides, Herbicides, Fertilizers and Other Pollutants: The 2002 road maintenance assessment report presented data on two herbicides, Razor and Pendulum, which were used by the County’s Office of Highway Operations in 2001. Pendulum, with 37.4% pendamethalin as the active ingredient, was noted to be an environmentally-unfriendly chemical with potential impacts to aquatic life. The report recommended that the County review its use and consider alternative treatments. As reported in the 2003 Pesticide/ Herbicide report (Versar, 2003) and subsequent NPDES Annual Reports (see Section 5.5.2), the use of Pendulum has been discontinued. Table 9 summarizes the County’s use of herbicides and pesticides.

Evaluation: The County’s Office of Highways and Transportation continues to implement the recommendations of the Road Maintenance Report and to experiment with new technology to reduce its activities’ impacts on water quality.

Data in relation to chemical application from Highway Operations can be found in the ChemicalApplication table in the MDE_NPDES_MS4 geodatabase.

5.5.3 Herbicides, Pesticides, Fertilizers

Because of concern for environmental health, MDE, through the requirements of NPDES MS4 Permits, requires local jurisdictions to evaluate their current uses of pesticides, herbicides, and fertilizers and to seek opportunities to reduce use of these materials. To address this requirement, during 2002-2003, Frederick County sponsored a study to characterize uses of pesticides, herbicides, and fertilizers by County agencies and to identify potential reduction strategies - *Recommendations for Alternatives to Pesticide/Herbicide/Fertilizer Use for Frederick County, December 17, 2003* (Versar, 2003).

Frederick County initiated this study in fall 2002 by surveying County divisions about pesticide, herbicide, and fertilizer use at all County-owned facilities and by all Frederick County Government agencies or departments. At the time, four County units were found to apply herbicides, pesticides, and/or fertilizers: (1) the Maryland Department of Agriculture’s (MDA) Vector Control Program, which works in conjunction with the Frederick County Mosquito Control Program, (2) the Division of Parks and Recreation, (3) Frederick County’s Office of Highway Operations, and (4) the Frederick County Weed Control Program.

Study results indicated that pesticide/herbicide/fertilizer use by Frederick County did not require any drastic reduction in application practices because County agencies had, in general, already minimized use of these chemicals, or were already using more environmentally acceptable substitutes. In most cases, the overall recommendation was to continue current chemical control practices, while considering possible biological and mechanical controls that could be used in place of, or in combination with, current practices.

A number of practices are already employed by County personnel to control the application of chemicals and, where possible, to use minimal amounts. Frederick County departments apply pesticides on an “as needed” basis. Any pesticide usage is documented in Appendix E. Fertilizer is applied one to three times per year at specific locations. Most of the departments surveyed indicated specifically that application rates were based on label instructions, and were made at the lowest rate required for effectiveness.

Herbicide Use

Frederick County Weed Control Program, Frederick County's Division of Parks and Recreation, and Frederick County's Office of Highway Operations continue to monitor weather conditions around the time of application; applications are not performed if heavy rain is expected within 2 hours of application. The Weed Control Program continues to verify that application personnel are registered with the Maryland Department of Agriculture (MDA) Pesticide Regulation Section and are either licensed applicators or work directly under the supervision of one.

As noted in the Road Maintenance Activities section (Section 5.5.1), Frederick County Highway Operations has discontinued the use of the herbicide Pendulum, which is toxic to aquatic life, and has replaced its use of Razor with more environmentally-friendly herbicides, which included Ranger Pro (a generic version of Roundup), DMA 4 IVM, and CWC-90 (a non-ionic surfactant) in 2015.

Location of Herbicide, Pesticide, and Fertilizer Application

County Highways spray logs were tallied, and information by watershed is provided in Table 8 - Highway Operations Estimated Herbicide Application within Each Watershed .

Table 8 - Highway Operations Estimated Herbicide Application within Each Watershed in FY21

Watershed	Estimated Gallons per Watershed
Catoctin Creek	354.44
Double Pipe Creek	169.80
Lower Monocacy River	1,622.94
Potomac River FR Cnty	94.21
Upper Monocacy River	485.98
Total	2,727.37

In regards to other County departments, herbicide application and location information is provided in individual spraying reports. Frederick County Facilities Maintenance contracted Gladhill Pest Control for spraying of County owned properties where needed. Totals from each department/program are provided in Table 9. Total herbicide usage within each watershed and the percentage of total herbicide for each watershed are presented in Table 10. As seen in the table, and as would be expected, Lower Monocacy River Watershed is the largest watershed in the County, and contained the largest application of herbicides. The figure in Appendix E shows where herbicide spraying occurred within the County's watersheds, when application point location information was able to be recorded.

Table 9 - Chemical Application Totals for Facilities Maintenance, Parks, Landfill, Reforestation

Chemical Name	Total	Units	Department/Program
Alpine EPA #499-561 Concentration 0.03%	0.15	gal	Glad Hill Pest Control

Chemical Name	Total	Units	Department/Program
Alpine WSG EPA #499-561 Concentration 0.03%	2.44	gal	Glad Hill Pest Control
Bither EPA #93923-1 Concentration 0.068%	0.15	gal	Glad Hill Pest Control
Bithor SC EPA #83923-2 Concentration 3%	0.05	gal	Glad Hill Pest Control
Demand CS EPA #100-1066 Concentration 0.06%	0.03	gal	Glad Hill Pest Control
Fast-Cap EPA #1021-1815 Concentration 0.06%	0.24	gal	Glad Hill Pest Control
Fast-Cap EPA #1021-1818 Concentration 0.05%	0.23	gal	Glad Hill Pest Control
Fast-Cap EPA #1021-1818 Concentration 0.06%	0.26	gal	Glad Hill Pest Control
Final Blox EPA #12455-89 Concentration 0.05%	0.01	gal	Glad Hill Pest Control
Gentrol EPA #2724-351 Concentration 1%	0.32	gal	Glad Hill Pest Control
Maki Mini Blocks EPA #7173-202 Concentration 0.005%	0.00	gal	Glad Hill Pest Control
NyGUARD EPA #1021-1603 Concentration 0.02%	0.02	gal	Glad Hill Pest Control
Onslaught EPA #021-2574 Concentration 1%	0.01	gal	Glad Hill Pest Control
Onslaught EPA #1021-1815 Concentration 0.06%	2.73	gal	Glad Hill Pest Control
Onslaught EPA #1021-2574 Concentration 1%	0.19	gal	Glad Hill Pest Control
Phantom EPA #241-392 Concentration 0.03%	0.10	gal	Glad Hill Pest Control
Tempo EPA #432-1363 Concentration 0.05%	1.41	gal	Glad Hill Pest Control

Chemical Name	Total	Units	Department/Program
Tempo EPA #432-1368 Concentration 0.05%	0.01	gal	Glad Hill Pest Control
Temprid EPA #432-1483 Concentration 0.05%	0.58	gal	Glad Hill Pest Control
Zenprox EPA #2324-804 Concentration 0.25%	1.38	gal	Glad Hill Pest Control
Ranger Pro EPA# 524-517, 2-4D (DMA-4) EPA# 627193, Nonionic Sufactant EPA# 524-517, 2-4D (DMA-4) EPA# 627193, Nonionic Sufactant	1,799.54	gal	Highway Operations
Pendulum Aquacap	2.37	gal	OSER, Creek Releaf
Roundup Max Pro	2.88	gal	OSER, Creek Releaf
Farm Works	13.80	gal	Parks and Rec
Glystor Plus	5.36	gal	Parks and Rec
Roundup Max	34.16	gal	Parks and Rec
Roundup Power Max	0.06	gal	Parks and Rec
Roundup Pro	18.60	gal	Parks and Rec
Escort XP	15.00	gal	Weed Control
Garlon 3A and Surfactant mix	22.50	gal	Weed Control
Razor Pro, Surfactant and Drift Control Mix	6.00	gal	Weed Control
Razor, and Surfactant Mix	11.20	gal	Weed Control
Transline and Surfactant mix	14.00	gal	Weed Control
Volunteer, and Surfactant Mix	510.68	gal	Weed Control
Volunteer, Surfactant and Drift Control Mix	226.82	gal	Weed Control

Table 3 - Percentage of total herbicide used within each watershed

Watershed	Watershed Area (ac)	Total Herbicide Used (gal)	% of Herbicide Total
Catoctin Creek	77,062.30	354.44	4.19%

Double Pipe Creek	123,395.61	169.80	2.01%
Lower Monocacy River	194,682.91	1,622.94	19.20%
Potomac River FR Cnty	43,100.50	94.21	1.11%
Upper Monocacy River	156,498.06	485.98	5.75%
Grand Total	594,739.37	2,727.37	100.00%

All herbicide, pesticide, and fertilizer use by County departments from 7/1/20 through 6/30/21, is presented in Appendix E; and data in relation to chemical application, along with historical application, can be found in the Chemical Application table in the MDE_NPDES_MS4 geodatabase.

5.6 Public Outreach and Education Program

In FY21, OSER staff continued to make impacts through the County's public outreach and education program. Due to the COVID-19 pandemic, many in-person outreach events were not held. Frederick County responded by increasing its outreach through social media and publications (electronic and print). Frederick County addressed permit-suggested outreach topics and met its own goals and objectives from *The Strategic Plan to Improve Water Quality through Public Outreach in Frederick County, Maryland*, published in November 2003. Outreach activities are used to educate citizens, to direct the course of watershed plans, and to identify landowners for potential restoration activities. OSER enhanced its outreach materials to provide its citizens with needed educational touchpoints.

In addition to the permit requirements for outreach, other key County initiatives are also mentioned below that can be seen in the following sections, and in the summary of public outreach and education activities in Table 11:

- Outreach related to the Monocacy & Catoctin Watershed Alliance (MCWA) and Green Leader Brigade;
- Outreach related to the Green Homes Challenge (GHC);
- Outreach related to Residential Septic Pump-outs;
- Outreach related to Pet Waste;
- Outreach related to Stormwater Management;
- Outreach related to Watershed Assessments and;
- Other County Outreach Initiatives.

Table 11 - Summary of Public Outreach and Education Activities FY21

Type	Date(s)	Description
Increasing Water Conservation		
Monocacy and Catoctin Watershed Alliance Web Page	Ongoing	The Monocacy and Catoctin Watershed Alliance webpage (http://watershed-alliance.frederickcountymd.gov) links to the County webpage and features information for citizens on stormwater outreach topics. The Watershed Alliance meets quarterly. Meetings were put on hold or made virtual due to the COVID-19 pandemic.

Type	Date(s)	Description
Rain Barrel Promotion	Ongoing	The Scott Key Center, a division of the Frederick County Health Department, offered water-saving Rainwater Collection Systems. Developmentally disabled clients at the Scott Key Center convert recycled olive barrels into rain barrels and make them available for purchase to Frederick County residents. Sales were put on hold due to the COVID-19 pandemic. OSER promoted rain barrel information through fact sheets and social media posts.
Commercial Property Assessed Clean Energy (C-PACE) Loan program	Ongoing	The Frederick County Council passed bill number 16-17 on November 15, 2016 to enable Frederick County to create a PACE program. The bill lists “Water conservation devices not required by law” as an eligible practice. Two businesses have taken advantage of this program to date.
New Market Green Team Rain Barrel Workshop	6/5/21	OSER Staff gave a presentation in partnership with the New Market Green Team on using rain barrels as a best management practice to control stormwater runoff
Residential and Community Stormwater Management Facility Implementation and Maintenance		
Point of Rocks Neighborhood Stream Restoration and Pond Retrofit	Completed	A stream restoration and pond retrofit were initiated as a result of the Point of Rocks Comprehensive Stormwater Master Plan.
Monocacy and Catoclin Watershed Alliance Meeting	4/14/21	The Monocacy and Catoclin Watershed Alliance held its quarterly meeting virtually with a live stream to Facebook. OSER staff gave a presentation on stream restoration techniques and current Frederick County stream restoration projects.
Homeowner Tip Sheets	Ongoing	OSER publishes tip sheets on stormwater and clean water –related topics that include “Pet Waste Facts”, “Composting-Do the Rot Thing”, “Rooting for Native Plants”, “Natural Household Cleaners”, “Lay Down the Lawn: Maintaining your Lawn While Protecting Water Quality”, “Raining in the Power of Rain Barrels”, “Design and Construction of a Rain Garden”, available https://www.frederickcountymd.gov/8138/Resources
Stormwater Maintenance Fact Sheets	Ongoing	With design templates from Charles County, OSER published fact sheets on property maintenance of stormwater best management practices, to include: “Guidance for Maintaining Dry Wells”, “Guidance for Maintaining Rain Garden, Bioswale, and Micro-Bioretenention Facilities”, “Guidance for Maintaining Porous Pavement”, and “Guidance for Maintaining Stormwater Management Ponds”, available at https://www.frederickcountymd.gov/7577/Best-Management-Practices

Type	Date(s)	Description
Creek ReLeaf Program	Ongoing	The Creek ReLeaf program is a multi-year reforestation program designed to increase the total amount of forested area within Frederick County, including privately owned lands and public properties. Forested lands provide stormwater control, reduce temperature impacts on County streams, and increase wildlife habitat.
Cambridge Farms Stream Walk	3/22/21	OSER staff hosted a stream walk at Cambridge Farms to discuss and educate residents about stream bank erosion.
Cambridge Farms Stormwater Education	2/24/21	OSER staff gave a presentation to the Cambridge Farms community about stormwater management.
Proper Erosion and Sediment Control Practices		
Woody Vegetation Control Methods Handout	Ongoing	County SWM inspection staff routinely hand out a one-page fact sheet, “Woody Vegetation Control Methods: Guidelines for Stormwater Facilities”, to homeowner associations, property management groups, developers, and others responsible for maintaining stormwater management facilities.
Inspection Program	Ongoing	Stormwater Management Facility inspections are conducted triennially with explicit direction for maintenance/correction when problems are discovered.
Improving Lawn Care and Landscape Management		
Homeowner Tip Sheets - Lawn	Ongoing	OSER publishes tip sheets on stormwater and clean water –related topics that include “Lay Down the Lawn: Maintaining your Lawn While Protecting Water Quality”, available at https://www.frederickcountymd.gov/8138/Resources
Pet Waste		
Pet Waste Survey	Ongoing	The OSER pet waste survey educates the public on why we should “scoop the poop” with dog waste having harmful bacteria that will end up in our waterways if not picked up. Results are included in the Media files of Public Outreach Appendix. Pet Waste Facts Postcard for homeowners can be found at: https://www.frederickcountymd.gov/7565/Pet-Waste The postcard also contains information about the location of pet waste stations in Frederick County parks. OSER shares pet waste facts and information on social media.
Frederick County Planning and Permits Office and Humane Society	Ongoing	OSER staff has pet waste management tip sheets information within the Planning and Permits Office and the Frederick County Humane society.
Residential Car Care and Washing		

Type	Date(s)	Description
Car Free Day	2/22/20	OSER promoted Car Free Day on social media outlets
Septic System Outreach		
Septic System Pump-Out Rebate Program	Ongoing	Frederick County Government Septic System Pump-Out Rebate Program was approved and open to the public on April 5, 2018 and has proven to be very successful. The program's success is possible through County outreach efforts and the support of the permitted septic haulers as well as the farm bureau, all working together to promote the program. OSER also shares this information regularly on our social media sites.
Septic Rebate Postcard mailing	Ongoing	Around 10,200 informational post cards about the septic rebate program to homes over 2 acres for septic since the program inception.
Homeowner's Guide to Septic Systems	Ongoing	OSER staff published Environmental Protection Agency (EPA's) Homeowner's Guide to Septic Systems along with a Septic System checklist at https://www.frederickcountymd.gov/DocumentCenter/View/300313
Frederick County Permits Office	Ongoing	Septic rebate applications within the permits office lobby area. Due to COVID-19 the permits office was closed to the public.
Frederick County Health Department	Ongoing	OSER staff works with Frederick County Health department in providing septic rebate packets for their office and events.
Increasing Proper Disposal of Household Hazardous Waste		
Household Hazardous Waste Day	Bi-annually	The County sponsors two household hazardous waste (HHW) days each year and promotes them widely in the media. Pharmaceuticals (in their original containers) are now acceptable items for drop-off at HHW events. HHW events were put on hold due to the COVID-19 pandemic.
Ballenger Creek Trail and Stream Cleanup	5/1/20	The Green Leader Brigade participated in a litter cleanup along Ballenger Creek Trail in Frederick, MD. The event resulted in 460 lbs of trash pulled from the Ballenger Creek Trail and stream.
Household Hazardous Waste Website	Ongoing	A website directs citizens to solutions for household hazardous waste at https://www.frederickcountymd.gov/3958/Household-Hazardous-Wastes

Type	Date(s)	Description
Prescription Drug Disposal	Ongoing	There are six sites throughout the county where citizens can safely dispose of their expired and/or unwanted household medicines and prescription drugs. This is a collaborative effort between the community and the Frederick County Health Department and local law enforcement agencies. The locations are: <ul style="list-style-type: none"> ○ Brunswick Police Department - 20 E. A St., Brunswick, MD 21716 ○ Emmitsburg Community Center - 2nd Floor, 300 South Seton Avenue, Emmitsburg, MD 21727 ○ Frederick Police Department - 100 West Patrick Street, Frederick, MD 21701 ○ Maryland State Police Barracks - 110 Airport Drive E., Frederick, MD 21701 ○ Middletown Municipal Center - 31 W. Main St., Middletown, MD 21769 ○ Thurmont Police Department - 800 Main St., Thurmont, MD 21788
Department of Utilities & Solid Waste Management (DUSWM) Web Page	Ongoing	The Department of Utilities & Solid Waste Management has information available on its website (https://frederickcountymd.gov/529/Landfill-Information) for County residents on various landfill programs, such as disposal of household hazardous wastes, recycling, source reduction, and backyard composting.
Used Motor Oil and Antifreeze Drop-off Sites	Ongoing	The county maintains a list of used motor oil recycling drop-off locations on its website (https://frederickcountymd.gov/529/Landfill-Information).
Provide Information to the Regulated Community		
Assistance to Municipalities on MS4 compliance	Ongoing	Staff routinely works with municipalities to help with elements of MS4 permit compliance including public outreach, illicit detection and elimination, source identification, and other topics. Some topics such as erosion and sediment control, plan review, and triennial inspections are covered by agreement with municipalities.
Maryland Municipal Stormwater Association	Ongoing	OSER staff served on the Executive Board of the Maryland Municipal Stormwater Association and worked to inform member jurisdictions on policy issues related to stormwater compliance.
Metropolitan Washington Council of Governments	Ongoing	OSER staff served on the Chesapeake Bay Policy Committee at MWCOG and shared information with member jurisdictions on stormwater and Chesapeake Bay policy issues.
Water Quality Technical Advisory Committee	Ongoing	OSER staff served on the WQTAC, researched water quality trading program best practices, and developed policy positions on behalf of MACo.
Outreach Events for All County Initiatives		

Type	Date(s)	Description
Green Leader Challenge interactive web page	Ongoing	The Green Leader Challenge, one of 3 sub-challenges that make up the overall Green Homes Challenge, helps County residents adopt environmentally friendly practices. In the Green Leader Challenge, there are 11 outdoor water conservation actions and 17 other outdoors and yard actions that educate and motivate Challenge participants to adopt lawn care and landscape management best practices. To date, more than 2,378 individuals have registered with the overall Green Homes Challenge and 322 are self-certified as Green Leaders.
Earth Day 2021	4/21/21	OSER was featured in a Frederick News Post article about Earth Day initiatives. Local environmentalists use Earth Day as a tool for education Environment fredericknewspost.com
OSER Social Media	Ongoing	OSER has a substantial social media presence and shares permit-suggested outreach on our social media sites (Facebook, Twitter, and Instagram). www.facebook.com/sustainablefcmd www.twitter.com/sustainablefcmd www.instagram.com/sustainablefcmd

Appendix F consolidates Frederick County media files of public outreach activities.

5.6.1 Outreach Related to Monocacy & Catoctin Watershed Alliance (MCWA)

As described in previous Annual Reports, the Upper and Lower Monocacy Watershed Restoration Action Strategy (WRAS) Steering Committees developed the Monocacy & Catoctin Watershed Alliance (MCWA or the Alliance) in order to continue outreach begun during the Upper and Lower Monocacy WRAS efforts and to begin implementation of the Upper and Lower Monocacy WRAS plans.

County staff continued to coordinate with MCWA in FY21. Quarterly meetings enable attendees to discuss educational outreach opportunities as well as develop restoration and protection projects to support water quality and habitat initiatives. Due to the COVID-19 pandemic, quarterly meetings were put on hold. Partners involved in MCWA include but are not limited to:

- Local Organizations
 - Audubon Society of Central Maryland
 - Catoctin and Frederick Soil Conservation Districts
 - Catoctin Forest Alliance
 - Frederick County Forest Conservancy District Board
 - Catoctin Land Trust
 - Frederick County Conservation Club
 - Frederick County Master Gardeners
 - Local Citizens
 - Bar-T Mountainside Challenge & Retreat Center
- Regional Organizations
 - Potomac Conservancy

- Potomac Watershed Partnership
- Interstate Commission on the Potomac River Basin (ICPRB)
- Center for Watershed Protection (CWP)
- Potomac Valley Fly Fishers, Inc.
- Chesapeake Conservation Corps
- Trout Unlimited
- Funding Agencies
 - Chesapeake Bay Trust
 - Alice Ferguson Foundation
 - Maryland Dept. of the Environment/U.S. EPA Clean Water Act Section 319 (h) Program
 - Maryland Urban & Community Forestry Committee (MUCFC)
 - National Fish and Wildlife Foundation (NFWF)
 - Chesapeake & Atlantic Coastal Bays Trust Fund
- Educational Institutions
 - Hood College
 - Mount Saint Mary's University
 - University of Maryland Extension Office
 - Frederick County Public Schools (FCPS)
- Government Organizations
 - Frederick County Council
 - Frederick County Executive
 - Frederick County Division of Planning and Permitting
 - Office of Sustainability and Environmental Resources
 - Comprehensive Planning
 - Development Review
 - Permits and Inspections
 - Division of Public Works
 - Division of Utilities and Solid Waste Management
 - Health Department, Environmental Health Section
 - Division of Parks and Recreation
 - Sustainability Commission
 - Municipalities in Frederick County
 - Maryland Department of Natural Resources
 - Forest Service
 - Fisheries
 - Watersheds Program
 - Wildlife & Heritage Service
 - Maryland Department of the Environment
 - Cunningham Falls State Park
 - National Park Service
 - Catoctin Mountain Park
 - Monocacy National Battlefield Park
 - Rivers, Trails and Conservation Assistance
 - U.S. Environmental Protection Agency
 - Environmental Information and Analysis
 - U.S. Fish and Wildlife Service

Public outreach efforts implemented by the Alliance during FY21 included Alliance website updates, the quarterly E-newsletters, and the Green Leader Brigade program.

The Alliance website (watershed-alliance.frederickcountymd.gov) includes events, past articles, links to quarterly meeting presentations, resources and publications. Information on MCWA is also available in the OSER quarterly e-newsletter, expanding the Alliance’s reach to more than 2,200 County households and/or Alliance partners.

5.6.2 Outreach Related to the Green Homes Challenge (GHC)

In addition to MCWA, OSER coordinates the Green Homes Challenge (GHC) program. The GHC combines proven outreach strategies and concrete actions in a unified, comprehensive approach that helps Frederick County residents adopt environmentally friendly practices, reduce energy use and utility bills, and use renewable energy.

The framework for the Challenge is a three-level Green Homes Challenge Certification Program; however, the educational, incentive, loan, and cooperative purchasing components are available to all whether or not residents choose to complete certification. The program incorporates incentives and behavior change strategies and is designed to meet the needs of people who like to do things themselves, prefer one-on-one mentoring, or are motivated by group participation.

The three Challenges and corresponding certification levels are:



1. **Be a Power Saver** -- Save Our Energy, Bank Your Money!

Focuses on engaging and educating Frederick County households about the benefits of saving energy; emphasizes home energy audits, energy saving action plans, and retrofit projects.



2. **Be a Green Leader** -- Green Your Lifestyle, Protect Our Resources!

Focuses on changes households can make related to their transportation, food choices, homes, yards, and offices that are environmentally friendly and reduce greenhouse gases. There are specific sections of this Challenge devoted to waste management, indoor and outdoor water conservation, and outdoor and yard maintenance practices to protect and improve water quality. This Challenge officially launched summer 2012.



3. **Be a Renewable Star** -- Renew Your Energy, Clear Our Air!

Focuses on promoting renewable energy options through purchasing green power and renewable energy credits, and installing renewable energy systems with assistance from grants and cooperative purchasing (Launched 2013). The outreach associated with the Green Leader Challenge focuses on improving water quality and addresses permit-suggested outreach topics.

As of June 30, 2021 more than 2,399 households had registered with the Green Homes Challenge and 327 households had completed Green Leader Certification. The Green Homes Challenge Recognition Event was planned for

2021, was postponed due to COVID-19.

Evaluation: Frederick County continues to excel in public outreach. Not only has Frederick County addressed all of the suggested topics for outreach in the NPDES permit, it has also extended its public outreach strategy to meet restoration goals. Frederick County has greatly expanded its network through partnerships with local and regional organizations, particularly through the Monocacy & Catocin Watershed Alliance. Agencies within Frederick County continue to educate the public about water quality through diverse programs.

6 Watershed Assessment and Restoration

6.1 Watershed Assessment

There are five 8-digit watersheds within Frederick County:

- Upper Monocacy River
- Lower Monocacy River
- Double Pipe Creek
- Catocin Creek
- Potomac River – Frederick County

Frederick County has completed all Watershed Studies for the five 8-digit watershed required by the MS4 Permit. Watershed assessments for Upper Monocacy River and Lower Monocacy River were completed in FY17 as well as a more focused assessment for Little Hunting Creek, located in the Upper Monocacy Watershed. In FY19, the Watershed Studies for Double Pipe Creek, Catocin Creek, and Potomac River – Frederick County were completed. These watershed studies have assisted the County in identifying additional cost-effective projects to assist in improving water quality in Frederick County and beyond.

Watershed assessment documents are available on the Frederick County's website:
<https://www.frederickcountymd.gov/8125/Watershed-Assessment-Documents>

Frederick County created watershed restoration action strategies (WRAS) and watershed assessments for several watersheds:

- Upper Monocacy River WRAS, completed May 2005 (Frederick County, 2005)
- Lower Monocacy River WRAS, completed May 2004 (Frederick County, 2004)
- An Assessment of Stream Restoration and Stormwater Management Retrofit Opportunities in Lower Bush Creek Watershed, completed in August 2003 (Perot, Morris et al., 2003)
- An Assessment of Stormwater Management Retrofit and Stream Restoration Opportunities in Ballenger Creek Watershed, completed August 2005 (Perot, Morris et al., 2005)
- An Assessment of Stormwater Management Retrofit and Stream Restoration Opportunities in Linganore Creek Watershed, completed June 2006 (Perot, Morris et al., 2006)
- An Assessment of Stormwater Management Retrofit and Stream Restoration Opportunities in Bennett Creek Watershed, completed April 2009 (Stribling et al., 2009).
- Final Report Watershed Assessment of Ballenger Creek, completed January 2001 (Roth et al., 2001a)
- Watershed Assessment of Lower Bush Creek, completed March 2001 (Roth et al., 2001b)

- Watershed Assessment of Lower Linganore Creek, completed in June 2002 (Perot, Morris et al., 2002)
- Bennett Creek Watershed Assessment, completed March 2008 (Stribling et al., 2008)
- Spring Ridge HOA Feasibility Study (May 2020)
- County-owned New BMP Assessment Frederick County, MD (June 2020)

6.2 Restoration Plans

As a requirement of sections PART IV.E.2.a and b of the NPDES MS4 Discharge Permit issued by MDE to Frederick County, the County developed and submitted the *Frederick County Stormwater Restoration Plan* to MDE in June 2016 (a court-issued postponement of six months at the behest of Frederick County Government) which addresses twelve TMDLs for local waterways, two TMDLs for the Chesapeake Bay, and impervious area restoration. The 2016 Restoration Plan was posted to the website on May 30, 2016. Public notice was published in the Frederick News Post on May 31 and June 1. The thirty day review period went from May 31 to June 30. All yearly updates to the Restoration Plan are made available to the public on the County's website.

On June 30, 2016, Frederick County submitted fourteen TMDL Restoration Plans including twelve local and two Chesapeake Bay TMDL Restoration Plans to satisfy this requirement as part of its Frederick County Stormwater Restoration Plan (Frederick County, 2016b). FY19 and FY20 updates to *Frederick County Stormwater Restoration Plan* were submitted to MDE alongside the annual report in December 2019 and 2020, respectively. An update for FY21 is included as Appendix G.

The BMPs outlined in this plan are continually updated in the MDE geodatabase submission as projects are updated. MDE_NPDES_MS4 geodatabase tables with these updates include: AltBMPPoly, AltBMPLine, AltBMPPoint, and RestBMP.

Frederick County's Stormwater Restoration Plan demonstrates that Frederick County Government is on track to meet the restoration efforts required under its current permit and has a long term plan to address its portion of stormwater wasteload allocations (SW-WLAs) for all TMDLs in Frederick County. This Plan presents the projects and programs that will provide treatment towards its impervious area restoration and TMDL requirements.

6.2.1 Impervious Area Assessment

Frederick County submitted its FY18 Annual Report in December 2018 as its fourth annual report submission for this permit term. At the MDE's request Frederick County included in this report submission a revised impervious surface cover assessment. MDE provided comments on this annual report submission on July 12, 2019.

In its comments, MDE states that it cannot approve the County's revised impervious cover assessment because the County's baseline update did not have adequate documentation to definitively identify the impervious acreages treated by various BMPs in the County's rooftop and non-rooftop disconnect analyses.

Frederick County notes that the revisions to the rooftop and non-rooftop analyses included in the County's impervious cover resubmission, and reported in the 2018 Annual Report Appendix O: Impervious Accounting Memo and geodatabase, were conducted in the expanded MS4 Boundary. However, the

update to the Boundary area was not provided for in Appendices with the FY19 report, Rooftop Disconnect Protocol and Non-Rooftop Disconnect Protocol. Essentially, the revised impervious cover assessment was conducted correctly, but the protocol document language detailing the new extent was not updated when submitted with the 2018 Annual Report.

MDE noted in its August 23, 2019 memo, which tentatively approved the County's Financial Assurance Plan, that approval of the impervious area analysis was still pending. The County updated the impervious cover restoration plan as well as two technical memos for rooftop and non-rooftop disconnect studies, and submitted them to MDE on September 30, 2019. Frederick County staff met with MDE on October 24, 2019 where it was decided by MDE that the impervious cover analysis was pending approval of the non-rooftop disconnect study. A field visit was planned to review the study findings with MDE; however, McCormick Taylor in reviewing for the field meeting discovered a significant error in its work for the rooftop and non-rooftop studies. They had used the wrong projection file that caused the county's restoration obligation to be underestimated by 711 acres. Again, the impervious cover assessment was conducted using the correct boundary and by the correct protocol but with an error in the projection which caused the discrepancy. The County worked with the consultant to correct the error, and to redouble efforts to look for baseline reduction credits in MDE-approved protocols.

Apart from the rooftop and non-rooftop disconnection issue, MDE does not appear to take issue with the County's methodology for the revised submission or its results, which is the same MDE-approved methodology MDE used with substantially similar results. In some instances, Frederick County had access to better source data, which resulted in slightly different numbers than what MDE calculated from its analysis. Frederick County respectfully submitted additional clarity in how it developed its impervious baseline by adhering to the methods outlined by Maryland Department of the Environment (MDE).

Based on the analysis provided in the Impervious Cover Restoration Plan, Rooftop and Non-Rooftop Disconnect Studies, Sheet flow to Conservation protocol submitted in December 2019, and the Field Review Memo of the Non-Rooftop disconnect submitted on February 14, 2020 and accompanying Appendices, Frederick County used MDE's guidance and comments to determine there are 13,396 total impervious acres within its boundary, of which 678 acres are treated with BMPs, 403 impervious acres are treated through rooftop disconnect, 2,259 impervious acres are treated through non-rooftop disconnect, 38 acres are treated through sheetflow to conservation areas, 51 acres are treated through existing grass swales, and 64 acres are treated by draining to Maryland State Highway Administration BMPs from the Frederick County MS4 area. This leaves the County with 9,903 untreated impervious acres. Based on the 20% restoration requirement, Frederick County will need to treat 1,981 impervious acres to meet its MS4 Permit Restoration requirement. A summary table detailing the impervious area assessment and credit is included as Table 12 below.

MDE's draft comments provided on April 6, 2020 approved the 1,981 impervious acre restoration goal for Frederick County; which included the Rooftop Disconnect memo, the Non-Rooftop Disconnect memo, the Existing Water Quality Grass Swale Identification Protocol and the Sheetflow to Conservation Protocol submitted as part of the 2019 Annual Report. In addition to the draft comments provided by MDE in April 2020, the County received a letter from MDE on July 1, 2021 stating that the Department accepted the County's 2020 Annual Report and confirmed that the County met the 20% restoration requirement (i.e., 1,981 acres).

Table 12 - Impervious Accounting Baseline Calculation

Frederick County Impervious Accounting	
Total Impervious (acres) within MS4 Permit Area	13,396
– Treated Impervious (acres)	(-678)
– Rooftop Disconnect (acres)	(-403)
– Non Rooftop Disconnect (acres)	(-2,259)
– Sheetflow to Conservation Area (acres)	(-38)
– Existing Grass Swales (acres)	(-51)
– Treated Impervious draining to MD SHA's BMPs from Frederick County MS4 area	(-64)
Remaining Untreated Impervious (acres) as Baseline	9,903
– Multiply by 20% to determine Frederick County Impervious Restoration Goal (acres)	x (0.20)
Total Impervious (acres) within MS4 Permit Area to be restored¹	1,981

6.2.2 Restoration Plan

The individual plans in the County's Restoration Plan are organized by Restoration Tier. The tiers include Baseline, Completed, Programmed, Identified, and Potential scenarios. Baselines are the TMDL loads without restoration BMPs. Completed projects were finished between March 11, 2007, the expiration date of the previous permit, and by June 30, 2020, the end of the previous fiscal year. Programmed projects are either funded by the County's Capital Improvement Program or other programs during the permit term, which expired December 29, 2019. Identified projects can be found in the County's Watershed Assessments, Watershed Management Plans, Restoration and Retrofit Assessments, Stormwater Master Plans, and other documents completed by Frederick County Government and its partners and consultants to identify watershed restoration opportunities. Potential Projects are hypothetical projects based on the most cost-effective BMP types and acres of available land.

The Restoration Plan should be viewed as a planning document that is subject to the County's review and revision in future years consistent with adaptive management, which is a cornerstone of any good stormwater program. The plans include estimated dates and costs for completion of various projects that may change over time. The County's ability to implement milestone actions depends on approval and funding from the local governing body in future years. The Restoration Plan is subject to future refinement by the County based on new or additional information. The County conducted the initial effort in-house and updated its Restoration Plans with the consultant KCI Technologies, Inc. for 2017, 2018, 2019, 2020, and 2021. At MDE's request, Frederick County ensured the updated plan included individual TMDL updates and targeted deadlines to reach the targeted reductions. The County is dedicated to committing resources to TMDL compliance and presents timeframes that are realistically achievable. The Plan was modified in 2019 to include updates to the Impervious Cover Analysis. The Plan was modified in 2021 to estimate TMDL loads and load reductions using MDE's TMDL Implementation Progress and Planning (TIPP) spreadsheet tool. Updates were made to Potential Projects, estimated dates, and costs in order for the County to achieve local TMDL reduction targets due to changes from TIPP modeling.

shows the progress as of the end of the permit term was over 80 percent of the required total through restoration approved in MDE's stormwater accounting guidance (MDE SW 2014). Per MDE, a portion of the requirement may be met through credit exchanges in its nutrient trading program. The County proposed to address the remaining impervious surface restoration obligation through such trades, and met its impervious cover restoration requirement through trades that equaled 708.1 impervious acres of credit.

The County coordinated nutrient trading with MDE once the Discharge Monitoring Report (DMRs) were certified on March 10, 2021 and requested from MDE to purchase nutrient credits in the form of 17,356 Nitrogen and 123,533 TSS credits from the County's Ballenger-McKinney Wastewater Treatment Plant on April 2, 2021 which would satisfy the County's permit obligations of 708.1 acres in nutrient trading as well as MDEs requirements for the trade. On December 1, 2021, The County reached out to MDE for confirmation on trades and learned from Nicole Christ that MDE neglected to process the requested trades that were requested by email on April 2, 2021. As such, the County requested a status update and found out from Ms. Christ that the request was accidentally overlooked. She followed up by email on December 1, 2021 that the trades were fully executed. The email documentation is provided as an attachment in Appendix I. The trades appear on the Water Quality Trade registry, https://mde.maryland.gov/programs/Water/WQT/Documents/MDE_REGISTER_WEB.xlsx.

Since the last reporting period Frederick County has implemented additional projects and previously planted reforestation areas now meet the 2 inch diameter at breast height requirement. Table ES-2 below provides the updated impervious restoration credit by project type.

Table 13 ES-2 - Complete Impervious Restoration Credit by Type (December 29, 2014-June 30, 2021)

BMP Type	Total
Stormwater	
Micro-Bioretenention (MMBR)	2.74
Rainwater Harvesting (MRWH)	0.05
Bioretenention (FBIO)	1.70
Wet Extended Detention (PWED)	265.72
Wet Pond (PWET)	54.74
Sand Filter (FSND)	9.47
Stream Restoration	569.54
Outfall Stabilization	63.46
Tree Planting	216.23
Septic Denitrification	69.20
Septic Connections to WWTP	4.52
Septic Pumping	249.26
Vacuum Street Sweeping ¹	100.07
Redevelopment Restoration	8.59
Nutrient Trading	365.74
Total	1,981.03

¹ Annual practice averages credit over 5 years

Utilizing Section VII. Water Quality Trading of the November 2021 Accounting Guidance, Frederick County calculated the amount of credits that will need to be bought through the Water Quality Trading Program for the 365.74 impervious acre equivalent need. Per Equation 14 found in Section VII. Water Quality Trading, of the November 2021 Accounting Guidance, the County can purchase credits through the Water Quality Trading Program in varying amounts per nutrient to fulfill this obligation. As shown in table ES-3 below, a purchase of 4,827 Nitrogen credits would fulfill this obligation; as well would a purchase of 489 Phosphorous credits or 1,559,654 TSS credits. As provided for in the Accounting Guidance, Frederick County could also purchase excess amounts of a singular credit in lieu of acquiring another; allowing for a multitude of credit purchasing options.

Based on current restoration projects statuses and the MDE November 2021 Accounting Guidance, Frederick County proposes to purchase the remaining required nutrient trading credits from the Ballenger McKinney treatment plant in Frederick County to remain in compliance for this reporting term. The County will coordinate nutrient trading with MDE once the Discharge Monitoring Report (DMRs) are certified in 2022.

Table ES-3 - Nutrient Trading Credit Conversions per November 2021 Accounting Guidance

Nutrient	Impervious Acre Credits To Be Acquired	Translation into EOS Load Reductions (lbs at EOS)	Frederick County EOS-EOT Conversion Factor	Calculated Equivalent WQTP Nutrient Credits (lbs/yr)
Total N	365.74	18.08	0.73	4,827
Total P	365.74	2.23	0.60	489
TSS	365.74	8,046	0.53	1,559,654

A detailed list of completed restoration activities is provided in Appendix H and more detailed information about the County's restoration efforts are found in the revised restoration plan submitted with the FY21 Annual Report in Appendix G.

6.2.3 Future Stream Restoration Implementation, Inspection and Maintenance

Frederick County appreciates the dialogue with MDE regarding our existing and future stream restoration projects that assist the County in meeting its MS4 Permit and local and Bay TMDLs. While Frederick County is ensuring there is adequate inspections for existing stream projects after large storm events, it will be developing a Standard Operating Procedures (SOP) to solidify this commitment to MDE during the next generation permit. Frederick County participated in the Chesapeake Stormwater Network's (CSN) Webinar on September 26, 2020 to enhance its stream restoration maintenance assessments. The County will be following the guidance from the Chesapeake Bay Program approved Memo, Recommended Methods to Verify Stream Restoration - Practices Built for Pollutant Crediting in the Chesapeake Bay Watershed, June 2018. Frederick County understands that initial quick maintenance adjustments save the County and stream significant repairs later if unchecked; thus, the County also plans to implement new management tools within its geodatabase through ESRI's suite of applications to assist with project tracking and associated maintenance. In January 2020, the County also secured a five year renewable contract for five on-call construction contractors to assist in repairing and maintaining County-responsible stream restoration and stormwater management facilities.

As Frederick County ends its fourth generation of the MS4 Permit, it is reviewing the new November 2021 MDE Accounting for Stormwater Management Guidance document to revamp its programs to meet these requirements. Based on this information, County staff directed its consultants to provide all necessary monitoring requirements stated in the most recent guidance document effective immediately on all actively designed and under construction stream projects with anticipated completion beyond December 29, 2019. While these unanticipated additional costs to capture this information was not factored into its project costs, Frederick County is happy to report all active projects will include MDE's requirements to be considered creditable for the next generation MS4 Permit.

6.3 Public Participation

As required by Part IV.E.3 of the MDE NPDES MS4 Discharge Permit, public participation is required for Frederick County's watershed assessments and restoration plans. The specific requirements include:

1. Notice in a local newspaper indicating a 30-day public comment period for each watershed assessment and restoration plan.
2. Notice in a local newspaper announcing that public information procedures are provided on the County's website for each watershed assessment and restoration plan, and
3. A summary in the Annual Report on public participation activities for each of the watershed assessments and restoration plans.

Frederick County has completed its Restoration Plan and several assessments, of which final versions are posted to our website. All drafts of the Restoration Plan and watershed assessments were advertised through the local newspaper, Frederick News Post, posted to the website for a 30-day public comment period. Copies of all the advertised notices are found in Appendix J.

The draft 2016 Restoration Plan was posted to the website on May 30, 2016. Public notice was published in the Frederick News Post on May 31 and June 1. The 30-day review period went from May 31 to June 30. The Final 2016 Restoration Plan was submitted to MDE on June 30, 2016. All yearly updates to the Restoration Plan are made available to the public on the County's website.

The following drafts of the following assessments were advertised through the Frederick News Post and posted to the website for a 30-day public comment period on October 7, 2017 with no comments received, which ended on November 26, 2017:

- Upper Monocacy Watershed Assessment
- Lower Monocacy Watershed Assessment
- Ballenger Creek Stormwater Master Plan
- Little Hunting Creek Watershed Assessment and Restoration Concept Report
- County-owned Stormwater Management Best Practices Retrofit Assessment, and
- Point of Rocks Storm Drain Analysis

The following draft watershed assessments were available for public review from June 1 through June 30, 2019 and received no public comments:

- Catocin Creek Watershed Assessment
- Double Pipe Creek Watershed Assessment
- Potomac Direct Watershed Assessment

6.4 TMDL Compliance

The updated *Frederick County Stormwater Restoration Plan* is submitted with the County's FY21 Annual Report as Appendix G and includes the County's approach to addressing its local TMDL requirements including three bacteria, four phosphorus, and five sediment local TMDLs as well as nitrogen and phosphorus Chesapeake Bay TMDLs, and impervious area reduction requirements. Updates to the plan include addressing MDE comments on the previous plan, incorporating updates made in the County's geodatabase, and including any changes to pollutant loading and load reduction calculations. At the time of this final 4th generation MS4 Annual Report submittal, Frederick County did not receive specific comments from MDE related to its County's Restoration Plan update; however, in a letter dated July 1, 2021 from MDE's Jennifer Smith indicated that the County was on track in meets these goals. The County's geodatabase is consistently updated with updates from the restoration program. Frederick County updated the Restoration Plan in FY21 to include load reductions from new projects completed, programmed, and planned in their geodatabase and any changes made to the suite of planned projects. Another significant change in FY21, included modeling loads and load reductions for the County's nutrient and sediment local TMDLs using MDE's TMDL Implementation Progress and Planning (TIPP) spreadsheet tool. Further description of the TIPP is provided in the Restoration Plan and the sections below.

Baseline, target, permit and current loads for nutrient, sediment, and bacteria local TMDLs are presented in the MDE_NPDES_MS4 geodatabase table LocalStormwaterWatershedAssessment. Countywide baseline, target, permit and current loads are presented in the MDE_NPDES_MS4 geodatabase table CountywideStormwaterWatershedAssessment.

Baseline and target loads including modeling approach and projects included in each of the models are described, in detail, in the Restoration Plan. All County completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater

control initiatives through 12/30/2014 were modeled using the procedures outlined below to calculate 2014 permit loads, while all treatment through 6/30/2021 was modeled to calculate current loads.

The following sections present the methodology and resultant values for baseline, target, permit, and current loads are presented in the following tables in the MDE_NPDES_MS4 geodatabase: LocalStormwaterWatershedAssessment and CountywideStormwaterWatershedAssessment.

6.4.1 Local TMDL Requirements

There are currently 12 final approved TMDLs within Frederick County with SW-WLAs. It's necessary for permittees to determine whether their treatment plans can meet TMDL compliance targets, which is usually accomplished through modeling. However, models and calculations used to develop TMDLs are rarely the same ones used for implementation. TMDL modeling is focused on determining the maximum watershed load that will allow the waterbody to meet water quality standards. Implementation modeling does not involve the receiving water, but only the watershed load. The purpose is to determine the level of improvements or treatment that needs to be implemented to reduce existing loads to the TMDL amount.

Local TMDL Modeling

Frederick County's TMDLs were developed by MDE at different periods in time using a variety of models. Because the models are different, absolute values of loads will not be the same. In order to derive the County MS4-specific SW-WLA load reduction targets, MDE's published baseline values for each TMDL needed to be recalculated in an implementation model. The implementation model provides a new baseline based on conditions when the TMDL was developed. The load reduction is calculated from the percent reduction published in the TMDL. Translated load reductions calculated based on TMDL percent reductions and baseline loads modeled using Frederick County baseline urban pervious and impervious land use and baseline treatment will be the target reductions used for TMDL compliance for the Bay TMDL and nutrient and sediment local TMDLs.

Nutrient and sediment local TMDL loads and load reductions were modeled using MDE's TIPP for the first time in FY21. The TIPP was developed by MDE for use by MS4 jurisdictions for local TMDL modeling and planning and uses methods associated with Phase 6 of the Bay Model, which is consistent with the MDE 2020 and 2021 Accounting Guidances. The MDE 2020 Accounting Guidance is the draft version of the final MDE 2021 Accounting Guidance, published on November 5, 2021. The County will be updating the Restoration Plan next Fiscal Year (2022) to align with the November 2021 updated guidance.

Similar to FY20 methods, progress towards *E. coli* TMDL loads and reductions were determined using a modified version of the Watershed Treatment Model version 2013. Structural stormwater treatment was summarized from the County database, supplemented with literature values and Sanitary Sewer Overflow (SSO) loads and reductions calculated by the Division of Utilities and Solid Waste Management for secondary sources of bacteria.

Translated load reductions calculated based on TMDL percent reductions and baseline loads modeled as described above will be the target reductions used for TMDL compliance. These values are presented in bold in the Translated Reduction column of Table 14 and Table 15.

Refer to the Restoration Plan for FY21 progress towards the local TMDL reduction goals.

Table 14 - Translated Nutrient and Sediment Local TMDL SW-WLAs and Target Load Reductions

Watershed Name	Watershed Number	Baseline Year	Pollutant	MDE Published Reduction Percent ¹	Baseline Impervious Area ²	Baseline Pervious Area ²	Translated Baseline Load ³	Translated Reduction ⁴
Catoctin Creek	02140305	2009	Phosphorus	11.0%	1,032	8,357	13,886	1,527
		2000	Sediment	49.1%	880	7,666	22,864,764	11,226,599
Double Pipe Creek	02140304	2009	Phosphorus	73.0%	103	887	1,213	886
		2000	Sediment	46.8%	65	629	1,171,514	548,269
Lower Monocacy River ⁵	02140302	2009	Phosphorus	28.0%	5,407	24,212	43,746	12,249
		2000	Sediment	60.8%	4,677	23,355	86,466,215	52,571,459
Potomac River Montgomery County ⁶	02140202	2005	Sediment	36.2%	0	0	0	0
Upper Monocacy River	02140303	2009	Phosphorus	4.0%	1,262	8,340	14,741	590
		2000	Sediment	49.0%	1,105	8,006	21,600,212	10,584,104

Target reduction loads used for TMDL compliance shown in bold text.

1) Published Reduction Percent from the MDE TMDL Data Center SW WLAs for County Storm Sewer Systems in Frederick County

2) County MS4 urban impervious and pervious acres for the TMDL baseline year. This is determined based on GIS overlays of MDP mapped land cover, impervious cover aerial orthoimagery, and Frederick County's MS4 jurisdiction boundary

3) Baseline loads modeled using MDE's TIPP spreadsheet tool using County BMPs installed prior to the TMDL baseline year on top of baseline land use background loads.

4) Translated reductions calculated using MDE's TIPP spreadsheet tool by applying the MDE published percent reduction to the translated baseline loads.

5) The Lake Linganore watershed is listed under a separate phosphorus and sediment TMDL and is not included in this analysis.

6) The County is not proposing restoration measures for the Potomac River Montgomery County sediment TMDL because there is no urban area in the County's portion of this small watershed.

Table 15 - Calibrated *E. coli* Local TMDL Target Load Reductions

Watershed Name	Baseline Year	MDE Published Reduction Percent ¹	MDE Published MPR Percent ²	MDE Published Human and Domestic BST Percent ²	Target BST WLA Reduction Percent ⁴	Target BST MPR Reduction Percent ⁴	Translated Baseline Load bn MPN/yr ³	Translated BST WLA Reduction bn MPN/yr ⁴	Translated BST MPR Reduction bn MPN/yr ⁴
Double Pipe Creek	2004	98.80%	80.80%	57.00%	56.32%	46.06%	57,383	32,317	26,429
Lower Monocacy River	2004	92.50%	76.06%	49.00%	45.33%	37.27%	4,462,423	2,022,593	1,663,118
Upper Monocacy River	2004	97.00%	85.30%	50.00%	48.50%	42.65%	1,148,495	557,020	489,833

Target reduction loads used for TMDL compliance shown in bold text.

1) Published Reduction % from the MDE TMDL Data Center SW WLAs for County Storm Sewer Systems in Frederick County

2) Published MPR % and BST% from TMDLs for each watershed.

3) Baseline loads modeled in WTM using County BMPs installed prior to the TMDL baseline year on top of baseline runoff loads from MDP urban land use and secondary sources.

4) Calibrated reductions calculated by applying the product of the BST Human/Domestic percent and the MDE published percent reduction to the WTM calibrated baseline loads.

6.4.2 Bay TMDL

The Chesapeake Bay TMDL, established by the EPA (EPA, 2010), sets pollution limits for nitrogen, phosphorus, and sediment in the Chesapeake Bay Watershed. This TMDL, required under the Clean Water Act, was in response to the slow progress by states within the watershed to limit their pollutants to levels which meet water quality standards in the Bay and its tidal tributaries. Total limits set in the Bay TMDL for the states of Delaware, Maryland, New York, Pennsylvania, Virginia, West Virginia, and the District of Columbia are “185.9 million pounds of nitrogen, 12.5 million pounds of phosphorus and 6.45 billion pounds of sediment per year—a 25 percent reduction in nitrogen, 24 percent reduction in phosphorus and 20 percent reduction in sediment” (EPA, 2010). The TMDL also sets “rigorous accountability measures” for state compliance.

Compliance with the Chesapeake Bay TMDL is regulated in the permit through the use of the 20% impervious surface treatment strategy as described in greater detail in the following section. While not a requirement in the County’s MS4 permit, restoration strategies to meet local TMDL reduction targets and impervious restoration treatment were also modeled against the Bay TMDL goals in order to calculate progress.

The Chesapeake Bay Program’s (CBP) Chesapeake Assessment Scenario Tool (CAST) was used to estimate load reductions applied towards the Chesapeake Bay TMDL. Because CAST was developed specifically for Bay scale modeling for the Bay TMDL pollutants it was determined to be the more appropriate modeling tool for the Bay TMDL.

Results for 2014 permit and 2021 current loads can be found in the MDE_NPDES_MS4 geodatabase table CountywideStormwaterWatershedAssessment and are shown for information purposes only.

6.4.3 Pollutant Loadings

The results below present 2014 permit and 2021 current loads for all TMDLs.

All completed structural and nonstructural water quality improvement projects, enhanced stormwater management programs, and alternative stormwater control initiatives through 12/30/2014 were modeled to calculate 2014 permit loads, while all treatment through 6/30/2021 was modeled to calculate current loads. Permit and current loads for nutrient and sediment local TMDLs are presented in Table 16 and in the MDE_NPDES_MS4 geodatabase table LocalStormwaterWatershedAssessment. Countywide permit and currently loads are presented in Table 17 and are also provided in the MDE_NPDES_MS4 geodatabase table, CountywideStormwaterWatershedAssessment.

Table 16 - Permit and Current Loads for Local TMDLs

Watershed Name	Watershed Number	Pollutant	Permit Load ¹	Current Load ²
Catoclin Creek	02140305	Phosphorus	13,885	13,722
		Sediment	22,859,706	22,496,077
Double Pipe Creek	02140304	Phosphorus	1,213	1,108
		Sediment	1,171,514	804,897
		<i>E. coli</i>	57,385	55,330
Lower Monocacy River	02140302	Phosphorus	43,513	42,426
		Sediment	85,694,328	84,146,593
		<i>E. coli</i>	4,457,908	4,182,235
Potomac River Montgomery County	02140202	Sediment	0	0
Upper Monocacy River	02140303	Phosphorus	14,626	14,409
		Sediment	21,179,833	20,562,768
		<i>E. coli</i>	1,148,442	1,116,309

1) Including treatment from County BMPs through 12/30/2014

2) Including treatment from County BMPs through 06/30/2021

3) Loads presented as EOS lbs/yr for nutrient and sediment local TMDLs and as bn MPN/yr for bacteria local TMDLs.

Table 17 - Countywide Permit and Current Loads

Countywide Loads	TN-EOT lbs/yr	TP-EOT lbs/yr
Permit Load	768,919	56,264
Current Load	764,133	55,298

7 Assessment of Controls

7.1 Watershed Restoration Assessment

During the past year, Frederick County has worked on a number of initiatives to monitor, assess, protect, and restore watersheds. Appendices submitted in FY21 provide monitoring and assessment results, and summarizes progress on the County's watershed protection and restoration efforts from July 2020 - June 2021 from the long term monitoring occurring within the Peter Pan Run watershed.

7.1.1 Stream Monitoring to Identify and Evaluate Water Quality Problems

In 1999, Frederick County initiated its original stream monitoring program, the goal of which was to identify and evaluate water quality problems in its priority watersheds and subwatersheds by conducting, on a rotating basis, stream monitoring using both biological and physical habitat methods. Monitoring was conducted every two to three years in the County's three highest priority watersheds: Lower Bush Creek, Ballenger Creek, and Lower Linganore Creek. This continued until 2006.

In 2007, the County conducted a pilot program that would serve as the basis for a new approach to stream monitoring that would begin to look at stream health throughout the County. Sampling at randomly selected locations was performed in the Bennett Creek and Catoctin Creek watersheds. Lessons learned in this pilot project were then used to refine the study design for a County-wide stream program.

In 2008, the County officially redesigned its monitoring program to include two separate monitoring efforts beyond the Watershed Restoration Assessment of the Peter Pan Run watershed: (1) targeted restoration monitoring and (2) County-wide, probability-based stream monitoring, with sites selected randomly and stratified by watershed. The targeted restoration monitoring effort for 2021 (July 2020 – June 2021) includes stream sampling at six targeted locations within the, Fishing Creek, Tuscarora Creek, Upper Bush Creek, Catoctin Creek, Little Pipe Creek and Lower Linganore Creek watersheds in support of on-going and potential future restoration and community outreach efforts. Monitoring efforts are selected on an individual project basis based on the projects' goals and any regulatory requirements directly related to those projects and the Restoration Monitoring Report is located in Appendix L. The County initiated its third County-wide round of monitoring (2018-2021) with its first round in 2008-2011 and its second in 2013-2016. County-wide monitoring reports are available on OSER's website for public access.

7.1.2 Watershed Assessment and Restoration Overview

The County's Watershed Restoration Assessment continued to focus on the Peter Pan Run watershed through targeted stream monitoring assessments including: physical, chemical, and biological data, collected during designated index periods (Southerland et al. 1999, Morgan and Roth 2005). Year 2021

sampling included collection of water quality data, benthic macroinvertebrate and fish sampling, and quantitative physical habitat assessment using MBSS habitat and geomorphic data collection methods. In FY20, the County financially invested in updating their Quality Assurance Project Plans (QAPPs) for the Biological and physical monitoring methods as well as the Water Chemistry monitoring methods, and are included within our Annual Report submittal. The revised QAPP's were written by the County's consultant, KCI, and included the newer monitoring equipment and the additional metals that the County added on, which was above the MS4 permit requirements and were followed during FY20 and FY21. The QAPP for Biological and Physical Monitoring was updated on August 2020 (Drescher et al, 2020), while the QAPP for the Water Chemical Monitoring was updated on November 2020 (Drescher et al, 2020) and are included in Appendix M and N respectively. These QAPP's updated the original Quality Assurance Project Plan for Biological and Physical Monitoring in Peter Pan Run and Other Selected Watersheds (Morgan and Roth, 2005).

As stated in previous Annual Reports, the County recognizes MDE's September 20, 2018 Annual Report comment regarding the missing outfall water temperatures. Since that comment was received, the County successfully installed a temperature meter as well as new water quality monitoring equipment to continue its efforts in capturing the required monitoring parameters.

It was another exciting year for Frederick County during this monitoring period as all of the pond retrofits were completed and this was the first full year to capture the impacts these have on the watershed. Fortunately, weather patterns allowed Frederick County to meet its required eight storm events at the Peter Pan Run instream and Pond-R outfall stations during the sampling period, July 1, 2020 through June 30, 2021. Key findings are summarized in Appendix K.

Data for all monitoring activities is included in the in the MDE_NPDES_MS4 geodatabase in the following features and tables: MonitoringSite, MonitoringDrainageArea, ChemicalMonitoring, LocalConcern BiologicalMonitoring, NarrativeFiles.

7.2 Stormwater Management Assessment

A detailed report capturing all of the long-term monitoring occurring in the Peter Pan Run watershed was completed to meet the requirement of the County's NPDES permit. A complete report of the findings can be found in the FY21 report. In FY20, Frederick County is also excited to be a part of the "Pilot Study of Water Quality Collected under Maryland's Municipal Separate Storm Sewer System (MS4) Phase I Permits" report produced by the Interstate Commission on the Potomac River Basin (ICPRB), Center for Watershed Protection (CWP), and MDE, and released May 20, 2020 (ICPRB et al, 2020). This report utilized three different MS4 Permittees' data to assist in providing MDE future recommendations on how the next generation MS4 Permit's assessment of controls may be improved and enhanced.

8 Program Funding

Frederick County has consistently maintained adequate funding to support the requirements of the NPDES program through its Operating and CIP budgets. This section outlines the budget from every fiscal year of the permit, including FY21. Expenditures for the year are presented in Appendix O.

The Operating Budget requires annual requests, with approval granted from year-to-year. Funds from the Operating Budget generally do not carry over from year-to-year. The CIP Budget noted here requires an annual submission, with approval granted from year-to-year.

The Operating budget for FY21 is \$4,074,768, including \$1,933,573 in the NPDES Pay-Go Operating budget, an estimated \$1,571,222 for Pay-Go Operating within other Departments and Divisions, and \$569,973 in debt service payments. The Capital budget was \$6,330,543. Grants were \$152,542. The total NPDES budget was estimated to be \$10,557,853.

The Operating budget for FY20 is \$2,867,844, including \$1,580,869 in the NPDES Pay-Go Operating budget, an estimated \$953,825 for Pay-Go Operating within other Departments and Divisions (using an estimate from FY19), and \$322,367 in debt service payments. The Capital budget was \$7,532,499. Grants were \$400,000. The total NPDES budget was estimated to be \$10,800,343.

The Operating budget for FY19 was \$3,252,363, including \$1,891,208 in the NPDES Pay-Go Operating budget, an estimated \$841,181 for Pay-Go Operating within other Departments and Divisions, \$262,974 in debt service payments, and \$257,000 in Operating Grants from other Divisions. The Capital budget was \$8,110,599. The total NPDES budget was estimated to be \$11,362,962.

The Operating budget for FY18 was \$2,525,967, including \$1,656,129 in the NPDES Pay-Go Operating budget and an estimated \$869,838 for Pay-Go Operating within other Departments and Divisions. The Capital budget was \$8,411,951. The total NPDES budget was estimated to be \$10,937,918.

The Operating budget for FY17 was \$2,673,697, including \$1,377,386 in the NPDES Pay-Go Operating budget and an estimated \$1,296,311 for Pay-Go Operating within other Departments and Divisions. The Capital budget was \$4,116,148. The total NPDES budget was estimated to be \$6,789,845.

The Operating budget for FY16 was \$2,650,420, including \$1,354,109 in the NPDES Pay-Go Operating budget and an estimated \$1,296,311 for Pay-Go Operating within other Departments and Divisions. The Capital budget was \$3,527,575. The total NPDES budget was estimated to be \$6,177,995.

The Operating budget for FY15 was \$2,383,553, including \$1,087,242 in the NPDES Pay-Go Operating budget and an estimated \$1,296,311 for Pay-Go Operating within other Departments and Divisions. The Capital budget was \$2,595,847. The total NPDES budget was estimated to be \$4,979,400.

More detailed information on budget allocations and costs are reported in the table FiscalAnalyses in the MDE_NPDES_MS4 geodatabase. Fiscal reporting for costs is based on the encumbrance method. Note that MDE's geodatabase excludes several permit categories to include Permit Administration, Legal Authority, and Source Identification. Several large efforts like the geodatabase and Annual Report are not included; the County has noted these expenses in comments. There is a timing lag between budgeting, encumbrances and expenditures, which largely explains why the encumbrance numbers do not match budget numbers. The geodatabase reporting does not match the FAP/WPRP reporting because the requirements for these reports differ.

As required by the Annotated Code of Maryland ENV §4-202.1, Frederick County submitted a Financial Assurance Plan (FAP) and Watershed Protection and Restoration Program (WPRP) Annual Report to MDE with the 2018 Annual report submission. Both documents provided the five-year funding strategy for addressing the County's NPDES MS4 Permit. The FAP and WPRP Annual Report documents were prepared by County staff. The County Council, as the "local governing body" held a public hearing and voted on approval of the Financial Assurance Plan on October 16, 2018. The FAP and WPRP Annual Report included all activities that have been completed in compliance with the Permit, and five-year projections to FY20 for the implementation of its stormwater program and best management practices (BMPs) necessary for meeting Permit requirements. MDE sent a letter to Frederick County on June 6, 2019 finding the FAP submission to have "insufficient data". MDE asked that the county resubmit an updated FAP by June 30, 2019. On June 28, 2019 the County resubmitted the FAP to MDE. On August 23, 2019, MDE sent Frederick County a letter stating that "the County has demonstrated sufficient funding as described in its FAP. This determination is contingent upon the approval of the County's impervious area analysis by the Department and the official approval of the FAP by the Frederick County Council. The Department requests that the County notify the Department when a public hearing has been scheduled to approve this updated FAP." MDE also noted that "the updated FAP listed the County's most current timelines for project implementation", that "the County proposed treating 65 acres of impervious area (approximately 5% of its ISRP requirement) by acquiring credits temporarily through the Maryland Water Quality Trading Program", and that "the County projects to complete approximately 1,270 acres of restoration (or 100% of the proposed 1,270 acre ISRP requirement) by the end of the permit term."

MDE noted in its August 23, 2019 memo, which tentatively approved the County's Financial Assurance Plan, that approval of the impervious area analysis was still pending. The County updated the impervious cover restoration plan as well as two technical memos for rooftop and non-rooftop disconnect studies, and submitted them to MDE on September 30, 2019. Frederick County staff met with MDE on October

24th where it was decided by MDE that the impervious cover analysis was pending approval of the non-rooftop disconnect study. A field visit was planned to review the study findings with MDE; however, McCormick Taylor in reviewing for the field meeting discovered a significant error in its work for the rooftop and non-rooftop studies. They had used the wrong projection file that caused the county's restoration obligation to be underestimated by 711 acres. Again, the impervious cover assessment was conducted using the correct boundary and by the correct protocol but with an error in the projection which caused the discrepancy.

Based on the analysis provided in this memo and in the FY19 Appendices, Frederick County used MDE's guidance and comments to determine there are 13,396 total impervious acres within its boundary, of which 678 acres are treated with BMPs, 403 impervious acres are treated through rooftop disconnect, 2,259 impervious acres are treated through non-rooftop disconnect, 38 acres are treated through sheetflow to conservation areas, 51 acres are treated through existing grass swales and 64 acres are treated by draining to Maryland State Highway Administration BMPs from the Frederick County MS4 area. This leaves the County with 9,903 untreated impervious acres. Based on the 20% restoration requirement, Frederick County needed to treat 1,981 impervious acres to meet its MS4 Permit Restoration requirement. This requirement was met for the permit through a combination of restoration and water quality trades. The County resubmitted its 2018 FAP to MDE with the first half year report for FY20 in order to accurately reflect the updated impervious acre mandate and meet MDE's requirement as well as the legislative requirement. Staff submitted the updated FY20 Financial Assurance Plan and Watershed Protection and Restoration Plan Report on December 29th, 2020. MDE approved the FAP June 14th, 2021 "contingent upon a public hearing and official approval by the local governing body." This hearing was scheduled August 17th, 2021 where a vote was held. The County Executive signed the certification on the FAP 8/23/2021.

The County has made a substantial commitment to comply with its Permit, has adequately funded the Permit, and met the financial requirements of the Permit, which is now administratively extended. The County ended the permit in full compliance with the Impervious Surface Restoration Plan (ISRP) requirement, demonstrating adequate funding. This funding is reflected in the past and current budgets, and is in the programmed CIP. This represents 100% of the cost to implement the Permit; furthermore, the County has funded the Permit at 100%, exceeding the 75% minimum compliance benchmark. All proceeds from the stormwater remediation fee go to the Watershed Protection and Restoration Fund. In FY20 this amounted to \$544.56.

Evaluation: Frederick County continued to maintain adequate funding to support its NPDES MS4 permit program through the end of the permit. Adequate funding was requested and approved to meet NPDES requirements in both the Operating and Capital Budgets. Adequate funding enabled the Watershed Management Section to complete its NPDES requirements in full compliance.

9 Special Programmatic Conditions

9.1 Bay TMDL

The Bay TMDL requirements related to restoration plans are addressed previously in section 6, specifically in section 6.4.6 Bay TMDL.

Maryland issued the Phase III Watershed Implementation Plan (WIP) for the Chesapeake Bay TMDL on August 23, 2019. Frederick County staff have actively worked to meet local goals of the Bay TMDL. Furthermore, Shannon Moore served as the chair of the Local Leadership Workgroup of the Chesapeake Bay Program beginning in early 2021. The efforts of LLWG help local governments to implement the goals of the Chesapeake Bay Program. Shannon and her team worked to incorporate DEI, climate change, land use, and flooding issues into the workgroup's goals as they related to the Bay Program. The LLWG also completed the Local Leadership Guide to the Chesapeake Bay, which can be found at https://www.chesapeakebay.net/who/group/local_leadership_workgroup. This series of educational modules was shared with organizations in every Bay state as well as with intergovernmental organizations like the Metropolitan Washington Council of Governments. The seven modules include such topics as How your Watershed Works, Capitalizing on the Benefits of Trees, and Protecting Your Infrastructure Through Stormwater Resilience. LLWG also partnered with the Local Government Advisory Committee, which is comprised of elected officials, to collaborate on key topics relevant to the Bay Program. Additionally, Shannon served as the Vice President of the Maryland Municipal Stormwater Association. This organization met bimonthly during the pandemic and promoted a number of topics and speakers related to TMDL development, implementation and tools for local governments in Maryland with MS4 permits. In particular, updates to CAST and Maryland's spreadsheet tool were discussed, as were climate change impacts to the Chesapeake Bay TMDL. Shannon also provided support to the Phase I MS4 permits group organized by the Maryland Association of Counties and MDCOG. This group addressed Chesapeake Bay TMDL implementation issues relevant to permit implementation.

Frederick County continues to support the now issued Phase III WIP and the implementation of the Chesapeake Bay TMDL. FY21 Capital and Operating budgets were proposed to the County Executive and adopted that are consistent with Frederick County's WIP III effort for the next budget cycle. Staff developed project concepts, and published its updated TMDL Restoration Plan in December 2019, with an additional update with this Annual report submission. This plan shows compliance with the Chesapeake Bay TMDL. Furthermore, Frederick County is adapting its implementation plan to align with the June 2020 and now the latest November 2021 MDE Accounting Guidance issuance, which shows updated crediting mechanisms for project types and will impact TMDL implementation strategy and completion rates moving forward.

The County continues to look for other sources of funding, including grants, to support their implementation of these efforts. Its efforts towards Bay restoration are strong.

9.2 Water Resources Element

The Board of County Commissioners formally adopted the complete Water Resources Element (WRE) technical document on September 23, 2010 (Frederick County, 2010). The WRE provides a detailed presentation of the County’s water resources plus limitations and challenges to meeting future population needs. Wastewater treatment capacities and future projected treatment needs are also analyzed. The WRE is divided into three components: Drinking Water Assessment, Wastewater Assessment, and Managing Stormwater and Non-Point Source Pollution. The WRE will be updated in Calendar year 2022.

APPENDIX A

County Attorney Certification

APPENDIX B

Industrial and Commercial Sources

APPENDIX C

IDDE Follow Up Documentation

APPENDIX D

SWPPPs Inspection Reports and Trainings

APPENDIX E

Herbicide, Pesticide, and Fertilizer Use

APPENDIX F

Media Files of Public Record

APPENDIX G

Restoration Plan

APPENDIX H

Completed Restoration Activities

APPENDIX I

Nutrient Trading Approval

APPENDIX J

Public Advertising of Watershed Assessments

APPENDIX K

Peter Pan Run Report

APPENDIX L

Restoration Site Monitoring Report

APPENDIX M

QAPP Peter Pan Run Biological

APPENDIX N

QAPP Peter Pan Run Chemical

APPENDIX O

Program Funding